

## **IBM Republishing Permission #30456**

IBM gave permission to republish:

- P1071 - Installing and Supporting OS2 2.1 - 1st Edition
- P1071 - Installing and Supporting OS2 2.1 - April 1994
- P1072 - OS2 2.1 Advanced Supported Workshop Course
- S7049 - Extended Services for OS2 Communication Manager - Student - Lab Notebook

IBM hereby grants to You a revocable, non exclusive, nontransferable, worldwide permission to reproduce, distribute to the public or display to the public, in electronic form only, the Documents, for educational and non-commercial purposes, under all copyright interests IBM owns in the Documents. For the avoidance of doubt, You may not prepare or reproduce or distribute any derivative works of the documents.

IBM MAKES NO WARRANTY, REPRESENTATION OR INDEMNIFICATION OF ANY KIND, EITHER EXPRESSED OR IMPLIED, CONCERNING ANY DOCUMENT, DESCRIPTION, OR THIS POLICY, WHICH ARE ALL PROVIDED "AS IS". THE WARRANTIES THAT IBM EXPLICITLY DISCLAIMS INCLUDE THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, AND ANY WARRANTY OR REPRESENTATION OF NON-INFRINGEMENT OF ANY THIRD PARTY'S INTELLECTUAL PROPERTY RIGHTS.

**Dated:** 2021-08-23

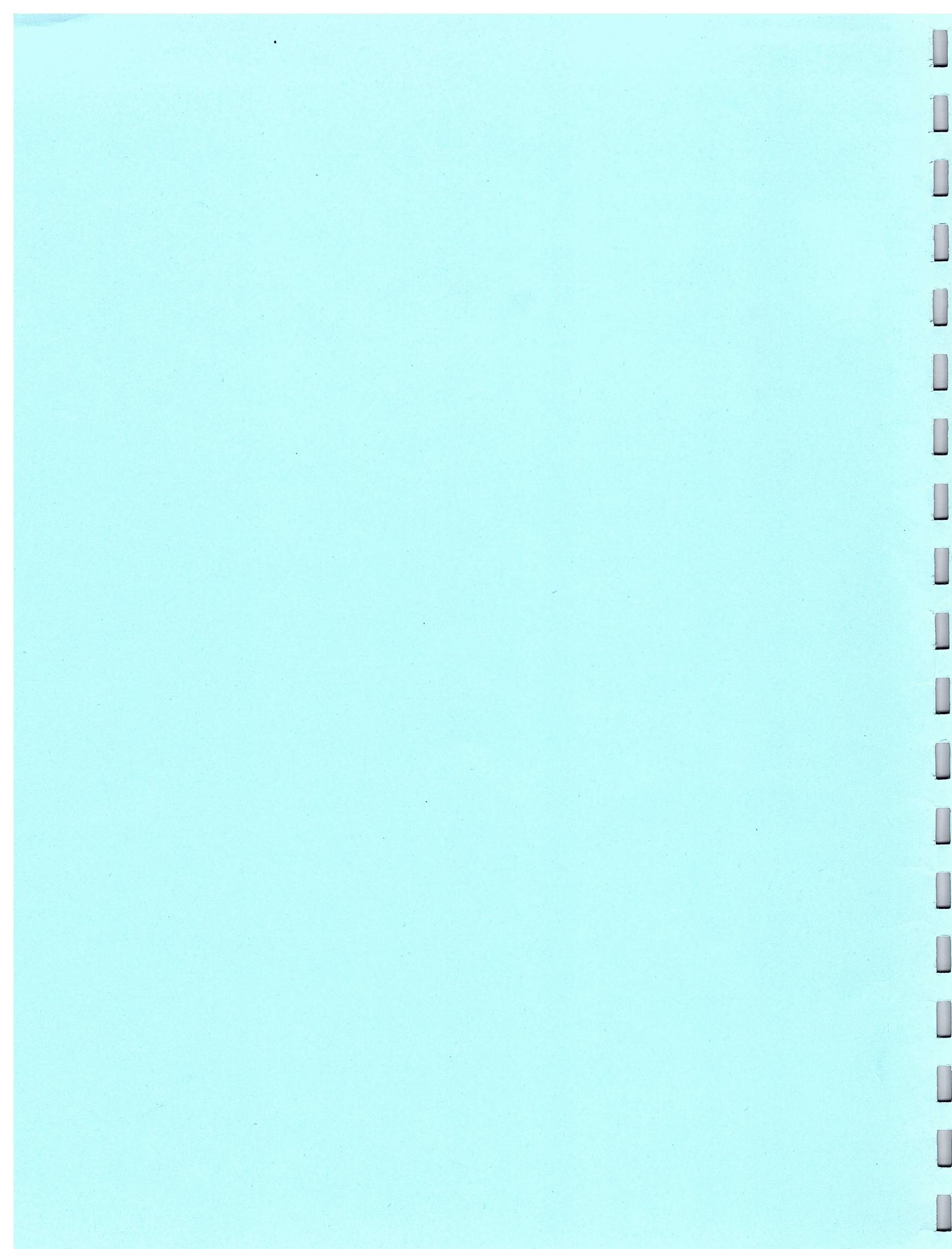


**Skill Dynamics Canada**

*An IBM Canada Ltd. Company*

**OS/2 2.1 ADVANCED SUPPORT  
WORKSHOP  
COURSE CODE P1072**

student notes

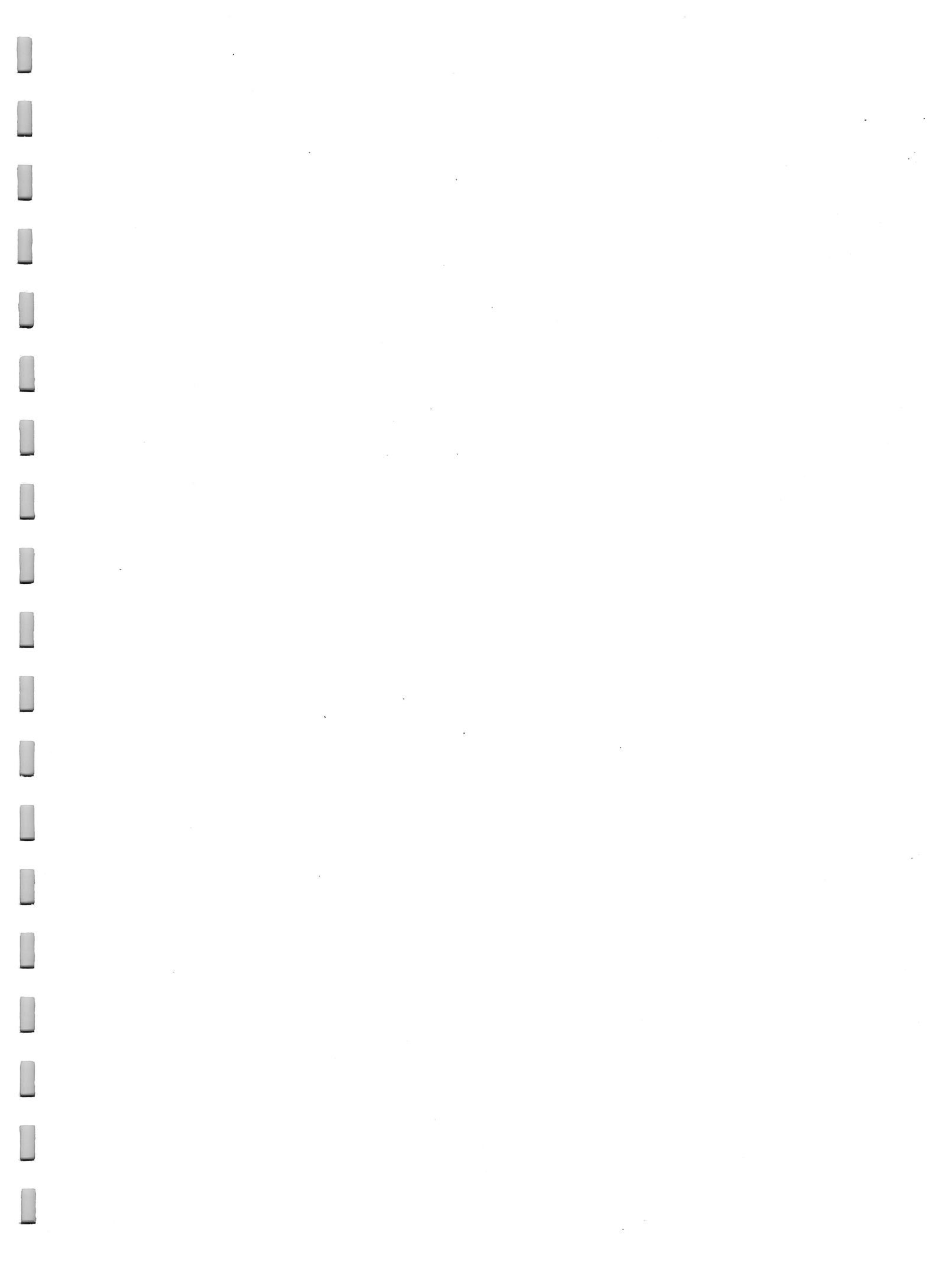


**OS/2 2.1 Advanced Support  
Workshop  
P1072**

March 24, 1994

Student Notes

Skill Dynamics Canada



## Preface

The *Restricted Materials of IBM*, if any, included in this document are made available subject to the terms and conditions of either:

- The Agreement for IBM Licensed Programs, or
- The IBM Agreement for Education Courses with Restricted Materials as stated in your country's IBM Education Catalog.

The terms and conditions of these contracts covering education materials are summarized as follows:

The customer shall use these Restricted Materials furnished by IBM solely for the purposes of the IBM education class in which they are provided. The Customer agrees not to copy any Restricted Materials. In the event the Customer has a license, under the terms and conditions of the Agreement for IBM Licensed Programs, for an IBM licensed program to which the provisions concerning Restricted Materials apply, the Customer may additionally utilize such restricted Materials solely for the following purposes:

1. making modification to the Customer's products and/or programs so that they will function with the licensed programs to which the Restricted Materials apply;
2. making modifications, subject to the provisions of the section entitled "Permission to Modify" of the Agreement for IBM Licensed Programs, to the licensed programs to which the Restricted Materials apply; and/or;
3. assisting the Customer in problem determination, problem source identification and/or problem resolution activities associated with the use of the licensed programs to which the Restricted Materials apply.

The Customer will not provide or otherwise make available any Restricted Materials, furnished by IBM under the Agreement for IBM Licensed Programs or the IBM Education Agreement for Restricted Materials as provided in your country's IBM Education Catalog, in any form without IBM's prior written consent except to the Customer's employees or IBM employees, or to other persons during the period such other persons are on the Customer's premises, for purposes specifically related to the Customer's authorized use of the IBM Licensed Program to which such Restricted Materials apply.

This publication has been produced using the IBM Document Composition Facility  
(program number 5748-XX9) and CorelDRAW™ by Corel Systems  
Corporation ©. It was printed on the IBM 3820 Page Printer.

**P1072, Third Edition (March, 1994)**

This edition applies to product OS/2 Version 2.1 and to all subsequent releases until otherwise indicated in new editions. Changes are continually made to the information herein. Before using these student notes in connection with the operation of IBM systems, consult the latest IBM publications that are available and current.

**© Copyright International Business Machines Corporation 1993**

# Course Introduction

Shawn Seaton.

## Course Description

This course offers Support Staff a chance to further extend their knowledge with regards to IBM OS/2 Version 2.1.

## Course Objectives

Upon completing this course, participants should be able to:

- Discuss the effects of altering various OS/2 parameters
- Create an "INF" file
- Create and run simple REXX programs
- Create and run programs that can automatically create folders and program reference objects on their Desktop
- Explain the how OS/2 handles the Video subsystem
- State the available OS/2 Support services
- Create a bootable OS/2 diskette
- Describe how OS/2 internally handles printing requests

## Course Contents

The topics which will be covered are:

- Resolving OS/2 bugs
- Introduction to "INF" files
- Introduction to Rexx
- Introduction to Advanced Rexx
- OS/2 Video
- OS/2 Support services
- OS/2 Maintenance and Recovery
- Os/2 Printing

### Note

This course is *not* intended to substitute for full technical information. The student must search the standard IBM documentation for some details. Such details rapidly change from release to release. Users should be familiar with the documentation accompanying OS/2 Version 2.1.

## **Related education**

### ***OS/2 User***

- P1069 OS/2 2.1 User workshop (1.0 days)
- P1069F Atelier OS/2 version 2.1 (1.0 days)
- P1070 Using and Customizing OS/2 2.1 (2.0 days)
- P1070F Utilisation et personnalisation d'OS/2 version 2.1 (2.0 days)

### ***OS/2 Support***

- P1071 Installing and Supporting OS/2 2.1 (3.0 days)
- P1071F Installation et soutien d'OS/2 Version 2.1 (3.0 days)
- P1072 OS/2 2.1 Advanced Support Workshop (2.0 days)
- P1081 OS/2 2.1 Performance and Tuning Workshop (2.0 days)
- P1082 OS/2 Problem determination (4.5 days)
- P1066 REXX programming for OS/2 (3.0 days)
- P1066F Programmation REXX pour OS/2 (3.0 days)

### ***OS/2 Programming***

- S7027 Introduction to OS/2 Presentation Manager programming (5.0 days)
- S7027F Introduction la programmation pour le gestionnaire de Presentation d'OS/2 (5.0 days)
- S7031 Advanced topics in OS/2 Presentation Manager programming (5.0 days)
- S7031F Programmation pour le gestionnaire de Presentation d'OS/2 (5.0 days)
- S7055 DB2/2 Application programming in C (3.0 days)
- S7056 C Programming for OS/2 (5.0 days)
- S7056F Programmation en C pour OS/2 (5.0 days)
- S7059 Introduction to OS/2 2.0 System Object Module and Workplace Shell programming (3.0 days)
- P1066 REXX programming for OS/2 (3.0 days)
- P1066F Programmation REXX pour OS/2 (3.0 days)

### ***DB2/2 for OS/2***

- S7052 DB2/2 Query Manager workshop (2.0 days)
- S7052F Atelier sur le gestionnaire de requêtes DB2/2 (2.0 days)
- S7053 DB2/2 Administration Workshop (4.0 days)
- S7054 DB2/2 Performance Workshop (4.0 days)
- S7055 DB2/2 Application programming in C (3.0 days)
- S6311 SQL Workshop (2.0 days)
- S6966 Distributed relational database planning (2.0 days)
- S9139 Distributed database workshop, OS/2 to DB2 (4.0 days)

### ***Communications Manager/2***

- S7049 OS/2 Communications Manager/2 (4.0 days)

## Trademarks

---

The following are trademarks of the International Business Machines Corporation:

- IBM
- Micro Channel
- Multimedia Presentation Manager/2 (MMPM/2)
- Operating System/2 (OS/2)
- Personal System/2 (PS/2)
- Presentation Manager (PM)
- Systems Application Architecture (SAA)

---

## **Contents**

---

**TOPIC 1: Resolving OS/2 Bugs** 1-1

---

**TOPIC 2: Introduction to INF files** 2-1

---

**TOPIC 3: Introduction to REXX** 3-1

---

**TOPIC 4: Introduction to Advanced REXX** 4-1

---

**TOPIC 5: OS/2 Video Support** 5-1

---

**TOPIC 6: OS/2 Support and Services** 6-1

---

**TOPIC 7: OS/2 Maintenance and Recovery** 7-1

---

**TOPIC 8: OS/2 Printing** 8-1

    Video Appendix 8-25

    Print Appendix 8-27



---

## TOPIC 1: Resolving OS/2 Bugs

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should be able to determine a system point of failure and correct the problem.*

*Enabling objectives:*

Upon completion of this topic the student should be able to:

- Gather information about a failure.
- Use that information for problem determination.
- Apply proper repair action.

**Prerequisite knowledge**

OS/2 course P1071 previous knowledge is required.



## When faced with a bug, consider....

**Determine: what is the problem?**

**Resolve the problem**

**Test your solution**

p1072102

---

Figure 1-1. Problem Determination

When problem occurs...

- What steps do you take to determine the source of the problem?
- Where do you research for possible solutions?
- What files should you consider looking at first?
- Who do you ask for assistance?
- Do you work from the 'broken' machine, or do you work from a working machine?
- Is the problem occurring as soon as the machine is powered on?
- Is the problem occurring as soon as PM appears?
- Is the problem occurring as soon as the Workplace shell starts?
- Do you keep track of what steps you have attempted?

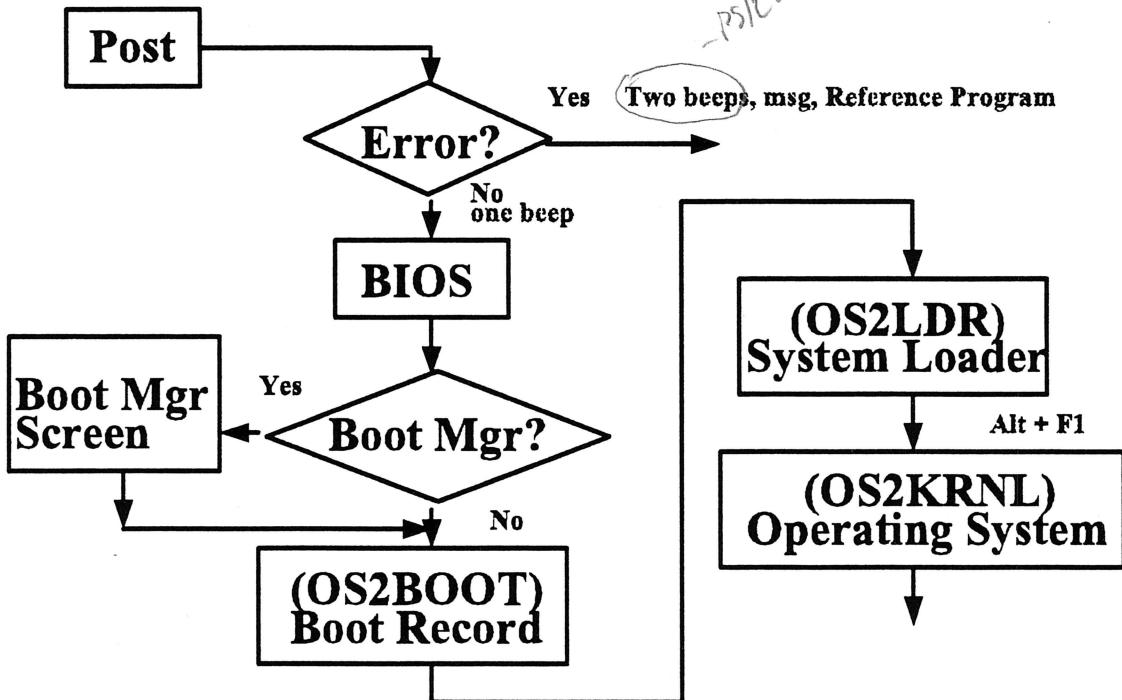
Depending on your experience level, some 'easy' problems can be hard problems to fix. As your experience expands, those hard problems will become easy problems.

When resolving a problem always try to get as much information as possible. For instance:

- Speak to the person who reported the problem
- Speak to the person who uses the machine that has the problem
- "See" the problem for yourself

These are but a few of the thoughts and actions you should perform to resolving any problem.

## OS/2 Boot Process:



p1072814

Figure 1-2. The OS/2 Boot Process

POST errors can sometimes be bypassed by F1.

The Boot Manager may be present and active but if the user has the startup values set to 0, you may not see the blue Boot Manager screen.

If the OS/2 Loader or Kernel is missing or damaged, a message is issued to reinstall; but if the OS/2 Boot Record is missing, there is a recovery procedure.

**Note:** The sequence of the three hidden files.

**Note:** Where the ALT + F1 key sequence is used.

- BIOS gets location of BootMgr. from Master Boot Record (MBR)
- in above example, Multi-Boot Block (MBB)

NAME	STARTING LBA

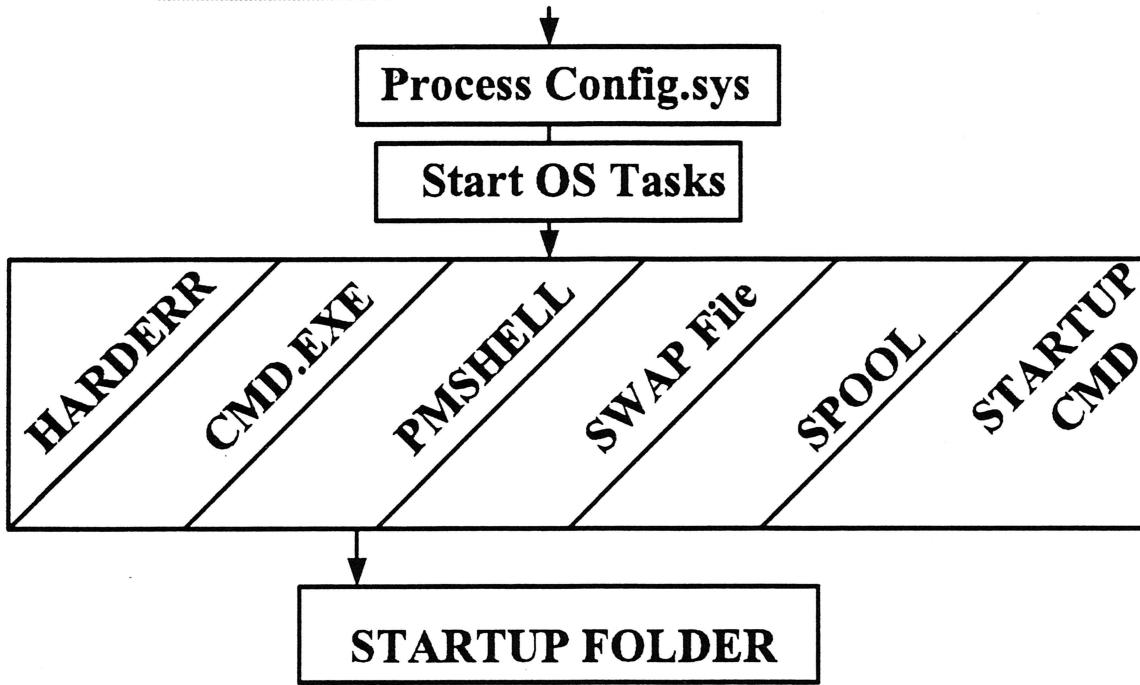
- this extends capability of MBR.  
i.e. multiple MBRS in a single table

XCOPY /T /H /E /R /S  
OS/2 Command "SYSINSTRX C" updates mbr

Points to OS2BOOT in MBR.

- End of all - In next - for - more - note

## OS/2 Boot Process continued:



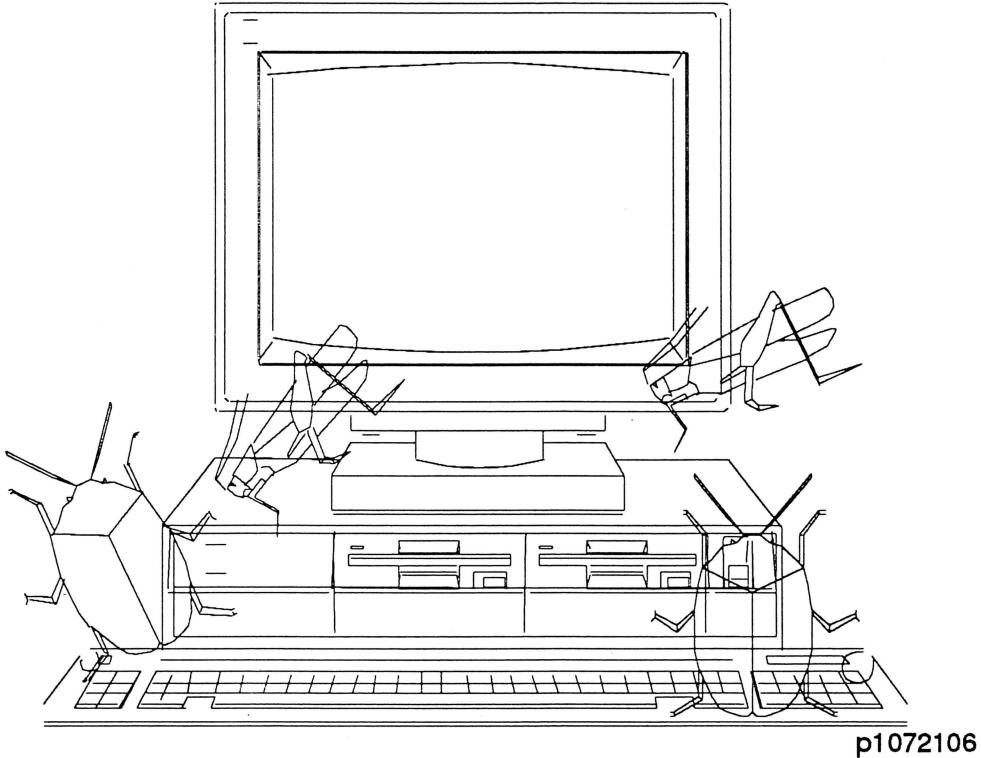
p1072816

Figure 1-3. The OS/2 Boot Process Continued

If the CONFIG.SYS is missing , a message saying "COUNTRY.SYS is missing" is issued. This message can also occur with an unsupported Disk Controller.

The key sequence CTRL+SHIFT+F1 will prevent automatic start of programs which were running at shutdown time. This action has a similar effect to setting the **SET RESTARTOBJECTS = NO** command in CONFIG.SYS.

**Note:** That the STARTUP.CMD runs before the INI files are used and that the STARTUP Folder runs after the Workplace Shell has been created.



---

Figure 1-4. A Bug!

In order to proceed with the Bugs, enter **BUG:** at a command prompt.

Enter the number of a Bug between **1** and **10**

If you wish to exit the bug program enter **0** (the number 0) at any time.

The **BUG**program will accept the bug number as a parameter.

You may enter a number for a Bug in any order, just be sure to record the Bug that you are working on should you require any assistance from the instructor.

## **Topic Summary**

In this topic the student learned to determine a system point of failure and to correct the problem.

This concludes the topic  
"Resolving OS/2 Bugs"

---

## TOPIC 2: Introduction to INF files

**Topic objective:**

*Terminal objective:*

*After attending this topic the student will be able to create a simple INF file.*

*Enabling objectives:*

Upon completion of this topic the student should be able to:

- State the requirements to creating an INF file
- Set up a two level heading in their INF file
- Highlight words in their INF file
- Create a list and table in their INF file
- Place a bitmap within their INF file
- Compile their INF file
- Use their INF file using the VIEW.EXE program



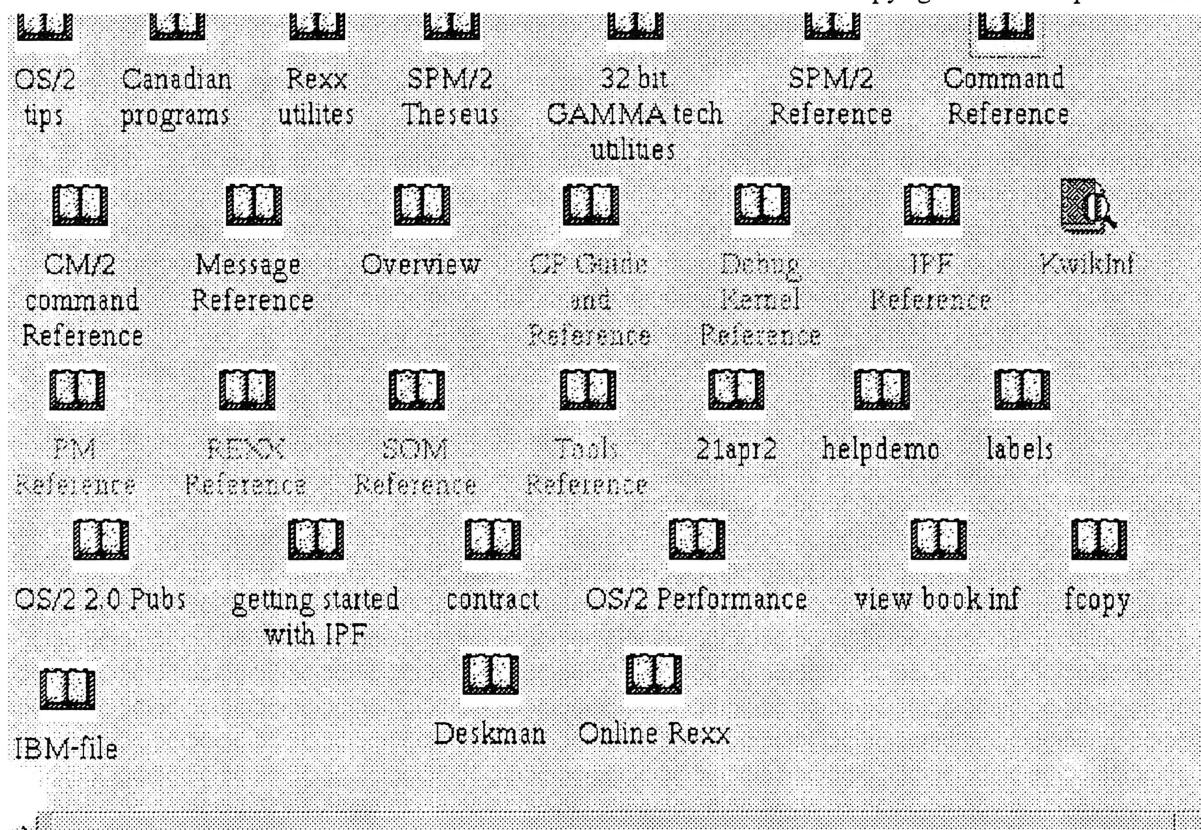


Figure 2-1. What are these?

The objects shown above, are known as on-line documents. On-line documents are developed by using the ***Information Presentation Facility*** (IPF) found in the OS/2 2.1 Toolkit.

IPF displays information through a familiar user interface and lets you do the following:

- View a table of contents from which you can quickly gain access to a category
- View the category and select related topics from a menu
- View multiple windows of related information for comparison
- Search for a topic throughout the document
- Copy the contents of a topic to the system clipboard for editing
- Copy the contents of a topic to a temporary file for editing

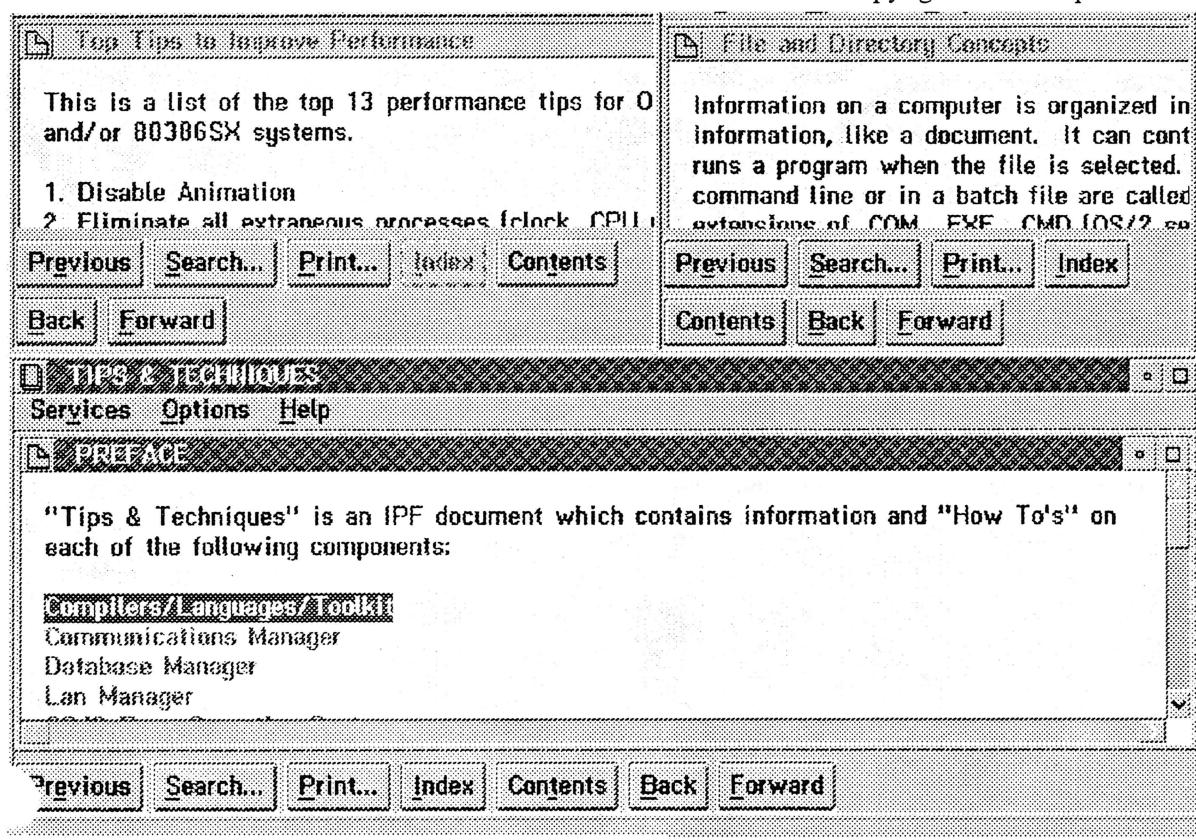


Figure 2-2. Viewing an INF file

The Information Presentation Facility (IPF) is a tool that enables you to create on-line information, to specify how it will appear on the screen, to connect various parts of the information, and to provide help information that can be requested by the user.

At compile time, for on-line documents, you direct IPF to generate a file with an INF file extension.

The View program, which is part of OS/2, enables you to display your compiled document. VIEW retrieves files with an INF extension and displays the formatted information.

## **Required tags for every document:**

- Only 3 tags are mandatory:

**:userdoc.**

**:title.**

**:euserdoc.**

p1072914

---

Figure 2-3. Required tags for every document.

- IPF tags

An IPF tag begins with a **colon** (:) and ends with a **period** (.). Some require Beginning and End tags, such as the main ones **:userdoc.** and **:euserdoc.**

A tag indicates how the text that immediately follows it is to be processed.

Some tags require end tags. An end tag is *e* immediately followed by the tag. For example, the end tag for the **:userdoc.** tag is **:euserdoc.**

Only 3 tags are required for every document:

- **:userdoc.**

Is always the first item in your source file. It identifies the beginning of an IPF file. This tag is a signal to the IPF compiler to begin translating the tag language.

- **:title.** - title, such as      My document

- **:euserdoc.**

This tag is required as the last line of the file to signal the end of the tagged document.

## **Headings:**

**:Hn. n = level number, 1 through 6**

**- Up to 6 levels**

**:h1. First heading level**

**:h2. Second heading level**

**:h3. Third heading level**

p1072916

---

Figure 2-4. Headings.

You can have up to 6 levels of headings. Place **:Hn.** at the beginning of a line, followed by the heading text. (n is the level number, 1 through 6):

**:h1.Chapter One**

Some tags have text strings associated with them. The string can immediately follow the tag, or it can start the line immediately following the tag. For example, the tagging for the title bar of a window is **:h1.** (one of the heading tags) and a text string, which is called a title string. You can enter it like this:

**:h1.The Basics**

Typically, your document will have headings and text:

```
:userdoc.  
:title.My Document  
:h1.Chapter One  
:p.This document was created using the Information  
Presentation Facility. It is very easy to use.  
:h2.Section  
:p.This is a sub-section, starting with a head-level  
2. It consists of a list:  
:ul compact.  
:li.This is a list  
:li.An "unordered" list  
:li.Using bullets  
:eul.  
:euserdoc.
```

## **Highlighting:**

**:HPn. n = level number**

**- Up to 9 levels**

**:hp1.Italics:ehp1.**

**:hp2.Bold:ehp2.**

**:hp9.Pink:ehp9.**

**p1072918**

---

Figure 2-5. Highlighting.

The :HPn. tags are used to highlight text, where n is a number between 1 and 9. Text will stay in the highlight mode until the :ehpn. tag is encountered.

Following are examples of using the highlighting tags:

```
:hp1.Italics:ehp1.  
:hp2.Bold:ehp2.  
:hp3.Bold Italics:ehp3.  
:hp4.Light Blue:ehp4.  
:hp5.Underlined:ehp5..  
:hp6.Underlined Italics:ehp6.
```

Output:

- *Italics*
- **Bold**
- ***Bold Italics***
- LIGHT BLUE
- Underlined
- *Underlined Italics*

## Lists:

### Unordered list (with bullets):

```
:ul.  
:li. Item one  
:li. Item two  
:eul.
```

### Ordered list (with numbers):

```
:ol.  
:li. apples  
:li. pears  
:eol.
```

### Simple list:

```
:sl.  
:li. Tables  
:li. chairs  
:esl.
```

p107291a

---

Figure 2-6. Lists.

All lists have a beginning tag and an end tag, which are different depending on the type of list. Every list item in between begins with the :li. tag.

Unordered List output:

- Item One
- Item Two

Ordered List output:

1. apples
2. pears

Simple List output:

Tables  
Chairs

## Tables:

**:table cols= 'xx xx'.**

**:row.**

**:c.**

**:etable.**

**:table cols= '15 45'.**

**:row.**

**:c. :hp8.First heading:ehp8.**

**:c. :hp8.Second heading:ehp8.**

**:row.**

**:c. First column, second row**

**:c. Second column, second row**

**:etable.**

p107291c

---

Figure 2-7. Tables.

Table tags enable you to display text in an arrangement of rows and columns. The system font used to create tables is the monospace font.

The table tag **:table.** signals the start of the Table. It requires a corresponding **:etable.** at the end of the table.

The row tag **:row.** specifies the start of each row in the table. Each row must have at least one column-entry tag **:c..** This tag specifies the text for each column in the table.

The **cols=' '** attribute of **:table.** specifies numeric values that represent the column widths, in character spaces, of each column in the table. The combined values cannot exceed 250 characters.

The number of columns in your table is determined by the number of column width values you have specified with the **cols=' '** attribute. For example, if you enter the values shown in the following, your table will have three columns, each of which will be eleven characters spaces wide.

**cols='11 11 11'**

## Fonts:

```
:font facename='System Monospaced' size=13x13.  
:table cols= '15 25'.  
:row.  
:c. :hp8.Day of the week:ehp8.  
:c. :hp8.Chores to perform:ehp8.  
:row.  
:c. Monday to Friday  
:c. Work day  
:row.  
:c. Saturday to Sunday  
:c. Relax (sometimes work too)  
:etable.  
:font facename=default size=0x0.
```

p107291e

---

Figure 2-8. Fonts.

The *:font* tag is used to change the current font within the text of the current window. When a heading tag that defines a new window is encountered, the font is reset to the system default font.

The font tag has three attributes: *facename*= and *size*= are required; *codepage*= is optional. If a code page value is not specified, the code page of the active system is used.

*Facename*= specifies the name of the font you want to change to. Some of the common values for this attribute are:

- *Helv\*\**
- *Courier*
- *Times Roman*
- *default*

*Size*= specifies the height and width, in points, of the font you have selected. (A point is a typesetting measure equal to approximately 1/72 of an inch.) The value is expressed in the form, HxW. For example, suppose you want to change the current font to an 18-point-high by 10-point-wide Helvetica\*\* font. You would specify:

```
:font facename=Helv size=18x10.
```

## **Linking ("Hypertext like"):**

**1 - "id" a section you want to reference**

**:h1 res=001.The Basics**

**2 - wherever you want a link to that section, code it:**

**:p.This will take you to**

**:link reftype=hd res=001.The Basics:elink. section.**

p107291g

---

Figure 2-9. Linking ("Hypertext" like).

Today, the computer's ability to link pieces of information gives the author flexibility in layering and structuring documents, and at the same time, provides cohesive information.

Links are electronic pathways that connect one on-line element to another. With IPF, the user can be linked from one window to another by means of selectable text and graphic areas that the author defines. The user also can be linked to information in another IPF database.

## Artwork:

**:artwork name='p10729i.bmp' align=center.**

**:artwork name='sttng2.bmp' align=left.**

p10729i

---

Figure 2-10. Artwork.

Bitmaps can be included in your document with the **:artwork** tag. Following is a simple tag to insert a bitmap, centered on the page:

**:artwork name='sky.bmp' align=center.**

The bitmap must be in the same directory as the source file when the document is compiled. Once compiled, the bitmap is stored in the INF file, and the BMP file is not required when viewing the document.

## ***Indexing:***

**To create index entries, place an entry  
where ever you want it:**

**:i1.Text of index entry**

**p107291k**

---

Figure 2-11. Indexing.

It's easy to create an index. Use the level 1 index tag for simplicity. (IPF provides many features for indexing - see the on-line IPF reference that comes with the OS/2 Toolkit).

To create index entries, place an entry anywhere you want it, eg:

**:i1.Text of index entry**

Keep in mind than when you select an item from an INF index, it takes you to the beginning of the panel where the entry is found (the head level immediately above the index entry). It does not take you to the particular line of text. So it doesn't matter where in the section you place the entry - selecting it from the index will take you to the beginning of the section.

You may not always need to have an index. It is handy in a hard copy document, however the powerful search facility of the VIEW program is often the better method to use for on-line documents.

## Compiling:

### **IPFC sample / INF**

**IPFC SAMPLE /INF > IPF.LOG**

#### **possible errors:**

**<sample.ipf: 207> 102: Invalid tag syntax  
[:font facename=default si]**

p107291m

---

Figure 2-12. Compiling.

Once the source document is prepared, compile it with the IPFC command. In the example, the source file name is SAMPLE.IPF. If it had an extension other than ".IPF", you'd have to specify the full FILENAME.EXT on the command, otherwise ".IPF" is assumed:

- IPFC SAMPLE /INF

If you've included artwork in your document, the bitmaps are compiled into the INF file. You do not have to distribute the bitmaps with the document.

As the compiler runs, it displays its progress. Any coding errors are listed on the screen. However, you'll find that the errors scroll off the screen. A good trick is to redirect output to a file. Then you can read the errors from the log file to make corrections to the source file. To do this:

- IPFC SAMPLE /INF > IPF.LOG

In this case, output is placed in IPF.LOG in the current directory. One with errors might look like:

Information Presentation Facility Compiler Ver 2.1

(C) Copyright IBM Corporation 1992. All rights reserved.

Compiling document with following Country Code, Code Page:  
1, 437

.....  
<ipfguide.IPF:207> 102: Invalid tag syntax :font face name=default si  
<ipfguide.IPF:208> 208: Missing tag ehp4.

<ipfguide.IPF:240> 203: Invalid symbol &  
<ipfguide.IPF:244> 102: Invalid tag syntax :what the heck

.....  
Resolving cross-references

Cross-references resolved

.....

Statistics :

Document title : Beginner's Guide To IPF

Total panels created	:	16
Panels defined by name	:	0
Panels defined by number	:	16
Words in dictionary	:	647
Global index entries	:	0
Total index entries	:	0
Total fonts used	:	3
Files referenced externally	:	0
Panels defined externally	:	0
Document's Country Code	:	1
Document's Code Page	:	437

Output file successfully created ipfguide.INF

The location of the error is given inside the < > brackets. In the first error :

1. <ipfguide.IPF:207> 102:  
Invalid tag syntax :font facename = default si

The error occurred on line 207 of the source file. The error code is 102.  
(Error codes are documented in the Compiler Error Messages section of the  
on-line IPF reference that comes with the OS/2 Toolkit).

## Topic Summary

In this topic the student was introduced to the creation of INF files, how to:

- state the requirements to creating an INF file
- set up a two level heading in their INF file
- highlight words in their INF file
- create a list and table in their INF file
- create a "hypertext like" link within their INF file
- place a bitmap within their INF file
- create an index in their INF file
- compile their INF file
- use their INF file using the VIEW.EXE program

This concludes the topic  
"Introduction to INF files."



---

## TOPIC 3: Introduction to REXX

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should be able to create simple OS/2 REXX programs.*

*Enabling objectives:*

Upon completion of this topic the student will be able to:

- Explain the purpose of REXX
- Write a simple, interactive REXX procedure

**Prerequisite knowledge**

No previous programming knowledge is required prior to attending this topic.



# REXX

**R**estructured

**e**Xtended

**e**Xecutor

*Language*

p1072500

---

Figure 3-1. What is REXX?

REXX is a versatile, easy to use, programming language that comes with OS/2. REXX's most vital role is that of a **procedural** language. With REXX, long, complex, repetitious tasks can be reduced to a single command.

REXX does not require a separate environment. REXX programs can be executed from an OS/2 command prompt or from a Workplace object.

Its simplicity makes it a good first language for beginners. For more experienced users and computer professionals, REXX offers powerful functions, extensive mathematical capabilities, and the ability to issue commands to multiple environments.

## **Features:**

**Ease of use**

**Free Format**

**Interpreted**

**Built-in Functions**

**Typeless Variables**

p1072502

---

Figure 3-2. Features

<b>Ease of Use</b>	The majority of the instructions are meaningful English words.
<b>Free Format</b>	REXX has few rules about format.
<b>Interpreted</b>	The source file is what runs. No compilation is required.
<b>Built-in Functions</b>	These exist to meet common requirements such as <i>Min</i> and <i>Date</i>
<b>Typeless Variables</b>	Variables need not be predefined.

## HELLO.CMD

**/\* A Conversation \*/**

**SAY "Hello! What is your name?"**

**PULL who**

→ PULL converts to upper case.  
PARSE PULL will take it exactly as entered.

**IF who = " " THEN SAY "Hello stranger!"**

**ELSE SAY "Hello" who**

cmd.exe  
interprets first line  
comment as saying  
this is REXX code.

p1072504

---

Figure 3-3. First Program

A REXX program is a list of instructions for your computer. The program is a text file that you have created with a text editor or word processing program. Sometimes a computer runs a program with no guidance. Other times it may need additional information from the user to perform its work. One way that a computer communicates with the user is to ask questions and then complete the work based on the answers. As the programmer, you can include instructions that let the computer converse with the user.

When you write a program, you will want to read it later. Other users of your program will also want to read it and know what the program is, what kind of input it can handle, what kind of output it produces etc.. All of these things, words that are to be read by people but not interpreted by REXX, are called *comments*.

One saves the program with the **cmd** extension. This is unlike a DOS batch file, which has a **bat** extension. It is not necessary to type the **.cmd** extension to start a REXX procedure.

Existing batch files can be converted to REXX procedures, with more power and function to them.

Your "OS/2 Procedures Language/2 REXX On-line User's Guide" provides exercises and examples to help you learn REXX.

## Variables

**symbol = expression**

**( name )      ( value )**

p1072506

---

Figure 3-4. Variables

Variables provide a means to handle changeable (dynamic) information by representing it in terms of symbols. A great deal of information that a program works with is unknown when the program is written.

Variables stand in for values to be obtained and processed.

Information stored in a variable is called the **value** of the variable. The value can be numeric, text, or nothing. As the value of the variable changes, the name remains the same.

## EXPRESSIONS

### **Terms:**

**Numbers**

**Literal strings**

**Variables**

**Function calls**

### **Operators:**

**Addition**

**Subtraction**

**Multiplication**

**Division ( 3 ways: /, %, // )**

p1072508

---

Figure 3-5. Expressions

An expression is a description of information that you want REXX to compute. It can be as simple as adding two numbers or as complex as you want to make it.

The process of REXX reading an expression and producing the result is called **evaluating** the expression.

## **COMPARISONS**

=                   **equal**

\=                   **not equal**

<> or ><       **not equal**

>                   **greater than**

/>                  **not greater than**

<                   **less than**

\<                  **not less than**

p1072510

---

Figure 3-6. Comparing Data

Comparisons **test** data rather than manipulate it. The comparison operators can be combined so that:

> = stands for greater than or equal to, and

\> = stands for not greater than or equal to.

The equal sign (=) can be used to assign value to a variable:

amount = 5 /\* assigns the value 5 to the variable amount \*/

or to compare values:

```
say amount = 5 /* compares the variable amount with 5 and returns */
           /* 1 if they are the same                                */
           /* 0 if they are not the same                         */
```

## **PROGRAM CONTROL**

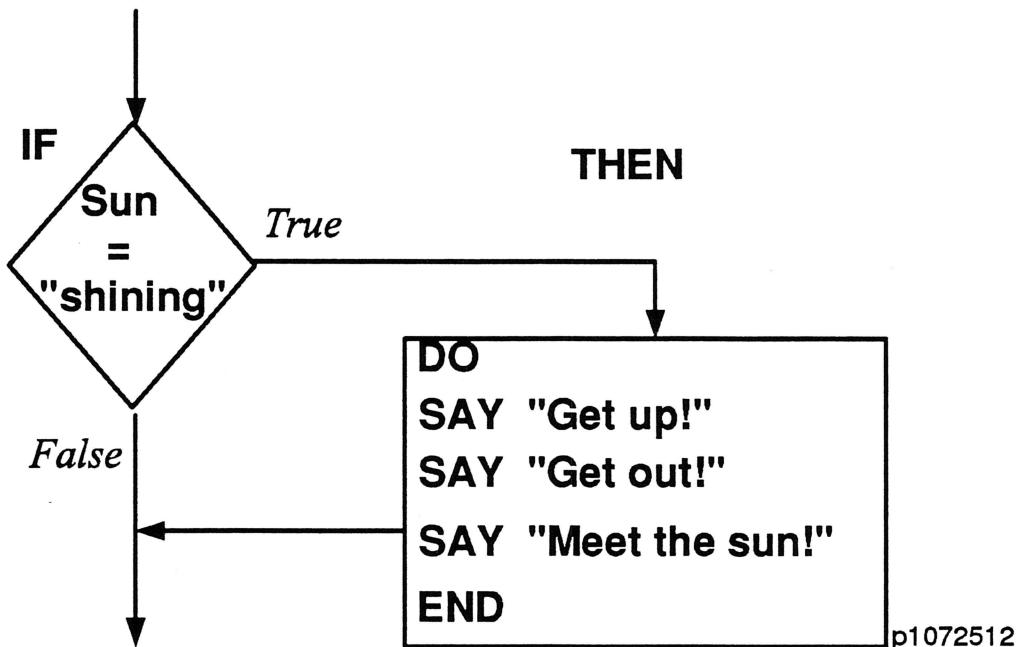


Figure 3-7. Program Control

Depending upon the user's interaction with your procedure, you may choose not to run some of your lines of code. The IF instruction is used with a THEN instruction to make a decision. The interpreter runs the instruction if the expression is true; for example:

```
IF answer = "YES"  
THEN  
SAY "OK!"
```

In the previous example, the SAY instruction is run only if answer has the value of YES.

To tell the interpreter to run a list of instructions after the THEN instruction, use:

```
DO  
Instruction1  
Instruction2  
Instruction3  
END
```

The DO instruction and its END instruction tell the interpreter to treat any instructions between them as a single instruction.

## Functions

**RETURN = FUNCTION(ARGUMENT)**

**SAY FUNCTION(ARGUMENT)**

p1072514

---

Figure 3-8. Functions

For more extensive computations, REXX has built-in functions. A function always returns (produces) a value. All function calls consist of a name followed by parentheses. There is no space between the name and the first parentheses.

Examples:

```
say abs(2 - ( 50 * 2)) /* displays 98 */  
say date()      /* displays the system date */  
say time()      /* displays the system time */
```

## **INPUT / OUTPUT**

**LINEIN(stream)**

**LINEOUT(stream)**

p1072516

---

Figure 3-9. Input and Output

REXX can do more than manipulate the information that the user has typed at the keyboard and then process it for display on the screen. REXX can store, access, print, and organize data outside the program.

REXX sees external information as a stream, a long, single-file, row of characters.

To read a line from a stream into a REXX program, use the LINEIN() function.

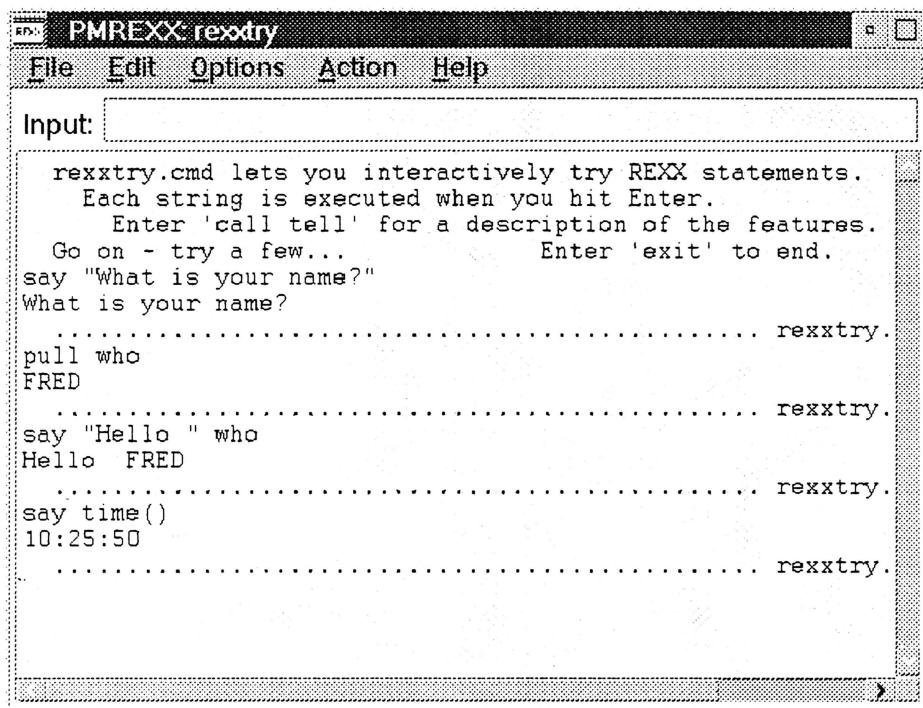
`linein(stream)`

Where **stream** is the name of the data stream (file) from which the line is read.

To write a line of text to a file, use the LINEOUT() function.

`lineout(stream, linedata)`

## PMREXX



---

Figure 3-10. PMREXX

You can run REXX programs from an OS/2 command prompt. You can also run REXX programs with the PMREXX command. PMREXX runs a REXX program in a Presentation Manager window. The PM window gives you:

- REXX TRACE
- Output browsing and scrolling
- Effective learning tool when used in combination with REXXTRY

## REXX REFERENCE

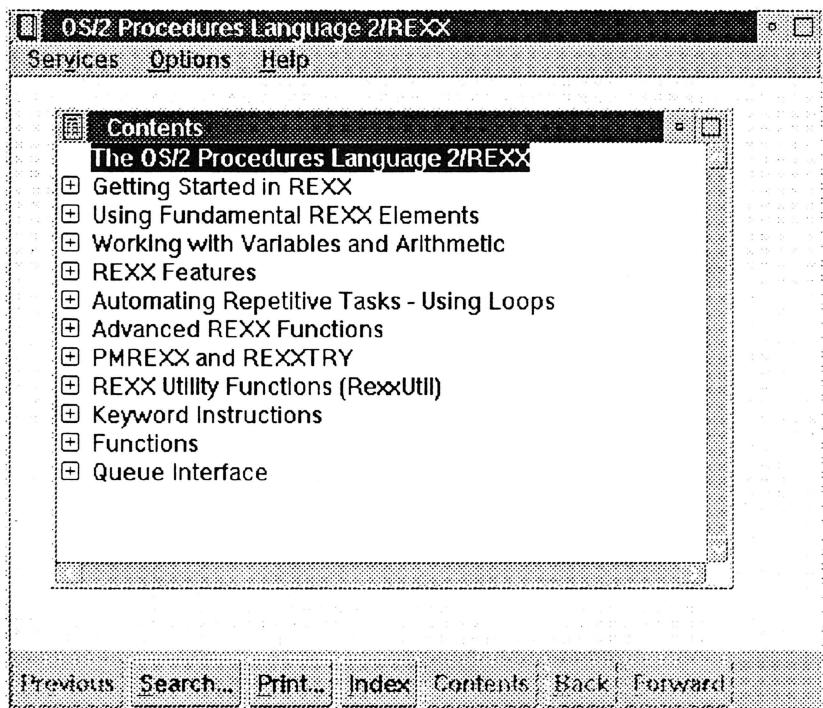


Figure 3-11. REXX Reference

The *IBM Operating System/2 Procedures Language 2/REXX User's Guide* describes the REXX programming language. Both inexperienced and experienced computer users should read this guide to learn about REXX.

## Summary

In this topic the student learned to create simple REXX programs.

The student was taught:

- The definition of REXX
- How to Write a simple, interactive REXX procedure

This concludes the topic  
"Introduction to REXX"

---

## TOPIC 4: Introduction to Advanced REXX

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should be able to apply some of the advanced functions offered by the OS/2 REXX.*

*Enabling objectives:*

Upon completion of this topic the student should be able to:

- Apply "loops" to automate repetitive tasks
- Describe some of the built in REXX Functions
- Describe the proper use of a CALL Statement
- Explain how to use REXX Utility functions
- Create objects on the Desktop using REXX
- Use REXX to view and change Initialization Files and Extended Attribute Information.

**Prerequisite knowledge**

The topic "Introduction to REXX" is required prior to attending this topic.



## **Automating Repetitive Tasks Using Loops**

### **Repetitive Loops**

### **Conditional Loops**

### **Getting out of Loops**

p1072600

---

Figure 4-1. Using Loops

In the first half of this Topic the DO statement was introduced as part of the IF statement when there was a need to run a list of instructions. There are several flavours of the DO instruction, we will look at some of those uses here.

The DO group is used to group instructions together to be executed as if they were a single instruction. Previously we saw the DO instruction run only once, now we will look at the different ways of using the DO, to execute more than a single time.

There are different ways of using loops depending on the expected result. Lets look at Repetitive and Conditional Loops and of course how to get out of Loops.

## Loops:

### Simple Repetitive

**DO 5**

**SAY "HELLO"**

**END**

**OUTPUT: HELLO**

HELLO

HELLO

HELLO

HELLO

### Controlled Repetitive

**X = 1**

**DO Z = X to 5**

**SAY Z**

**END**

**OUTPUT: 1**

2

3

4

5

p1072602

Figure 4-2. Repetitive Loops

- *Simple Repetitive Loops*

A Do Group can be made to execute more than a single time by including a number after the DO keyword. This value is known as the numeric repetitor which will execute the group by the number indicated.

The example shows a Do Group that will display the contents of a SAY statement by the indicated number.

- *Controlled Repetitive Loops*

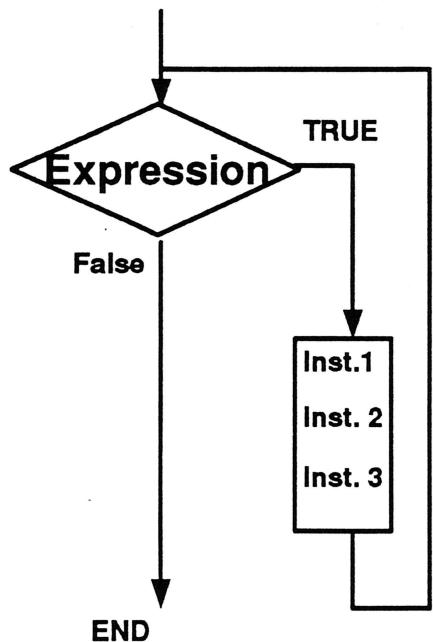
The controlled loop specifies a variable which is given a value before execution. During execution of the Do Group the value is incremented by 1 until the final value is reached. The instructions within the group will be executed until the value is reached.

- *Do Things Forever*

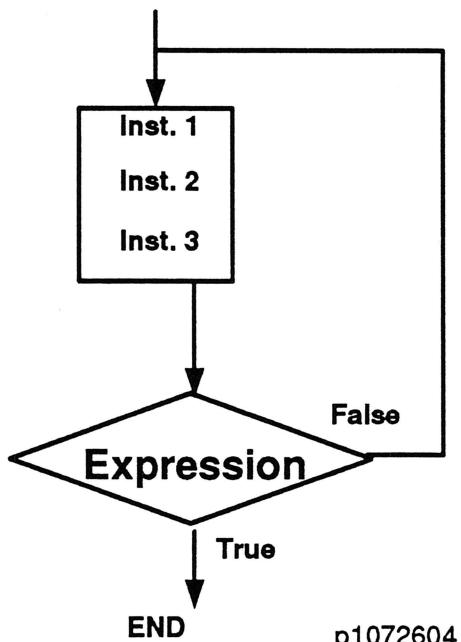
By putting the word Forever after the Do statement, will cause the instructions within that group to loop forever. To get out of a loop like this, use CTRL-Break.

## Loops:

### DO WHILE



### DO UNTIL



p1072604

Figure 4-3. Conditional Loops

- ***DO WHILE and DO UNTIL***

Conditional loops are run when a true or false condition is met.

Instructions are run while or until some condition is met.

The DO WHILE instruction tests for a true or false condition at the top of the loop; that is, before processing the instructions that follow. If the expression is true, the instructions are performed. If the expression is false, the loop ends and moves to the instruction following END.

A DO UNTIL instruction differs from the DO WHILE because it processes the body of instructions first, then evaluates the expression. If the expression is false, the instructions are repeated (a loop). If the expression is true, the procedure ends or moves to the next step outside the loop.

The DO UNTIL instruction tests at the bottom of the loop; therefore, the instructions within the DO loop are run at least once.

## Getting out with the LEAVE instruction

```
SAY "How much money do you have?"  
PULL money  
SPENT = 0  
DO UNTIL SPENT > money  
SAY "Lets spend some money OR END to quit  
PULL cost  
IF cost = 'END'  
    THEN LEAVE  
SPENT = SPENT + cost  
  
END  
SAY " Your wallet is now empty"  
EXIT
```

p1072606

---

Figure 4-4. Getting Out

- *LEAVE*

You may want to end a loop before the ending conditions are met. You can accomplish this with the LEAVE instruction. This instruction ends the loop and continues processing with the instruction following END. The above procedure, LEAVE.CMD, causes the interpreter to end the loop.

- *DO FOREVER*

There may be situations when you do not know how many times to repeat a loop. For example, you may want the user to type specific numeric data (numbers to add together), and have the loop perform the calculation until the user says to stop. For such a procedure, you can use the DO FOREVER instruction with the LEAVE instruction.

## Advanced REXX Functions

**MAX**

**DATA TYPE**

**SUBSTR**

**CALL**

p1072608

---

Figure 4-5. REXX Built-In Functions

- *Built-in Functions*

REXX has more than 50 built-in functions. A dictionary of built-in functions is in the Procedures Language 2/REXX Reference.

- **MAX**

Is a built-in function that you can use to obtain the greatest number of a set of numbers:

- **DATATYPE**

When attempting to perform arithmetic calculations on data entered from the keyboard, you can use the DATATYPE( ) function to check that the data is valid.

- **SUBSTR**

The value of any REXX variable can be a string of characters. To select a part of a string, you can use the SUBSTR( ) function. SUBSTR is an abbreviation for sub-string.

- **CALL**

The CALL instruction causes the interpreter to search your procedure until a label is found that marks the start of the subroutine and when complete, returns to a point after the CALL statement.

## Example of a CALL instruction

```
SAY "Enter any 2 numbers"  
PULL num1, num2  
IF NUM1 = '' THEN NUM1 = 0;  
IF NUM2 = '' THEN NUM2 = 0;  
CALL SUBROUTINE num1 num2  
EXIT
```

```
SUBROUTINE: ARG num1 num2  
           SAY "The total is" num1 + num2  
           RETURN
```

p1072610

---

Figure 4-6. The CALL

- *The CALL Statement*

The CALL instruction marks the start of a subroutine. Processing continues from within the subroutine until there is a RETURN or an EXIT instruction.

A subroutine can be called from more than one place in a procedure. When the subroutine is finished, the interpreter always returns to the instruction following the CALL instruction from which it came.

Often each CALL instruction supplies data (called arguments or expressions) that the subroutine is to use. In the subroutine, you can find out what data has been supplied by using the ARG instruction.

## Rexx Utility Functions (RexxUtil)

```
CALL RxFuncAdd 'SysLoadFuncs', 'RexxUtil',
               SysLoadFuncs'
```

```
CALL SysLoadFuncs
```

p1072612

---

Figure 4-7. Utility Functions

*RexxUtil* is a Dynamic Link Library (DLL) which provides the OS/2\* REXX programmer with many versatile functions.

RexxUtil requires that you are already running under OS/2 2.1 with OS/2 Procedures Language 2/REXX installed.

To be able to use a RexxUtil function in a REXX program, you must first add the function using the built-in function RxFuncAdd.

Example:

```
call RxFuncAdd 'SysCls', 'RexxUtil', 'SysCls'
```

The above example would add the SysCls function so that it can be used.

The RexxUtil function, *SysLoadFuncs*, will automatically load all RexxUtil functions. To do this from within a program, add the following instructions:

```
call RxFuncAdd 'SysLoadFuncs', 'RexxUtil', 'SysLoadFuncs'
call SysLoadFuncs
```

**SysCurPos**

**SysDriveInfo**

**SysDriveMap**

**SysFileTree**

**SysFileSearch**

**SysMkDir**

p1072614

---

Figure 4-8. Some Functions

Over 30 Utilities are available.

**SysCurPos** Move the cursor to the specified row and column and/or query the current/previous cursor position.

**SysDriveInfo** Returns drive information, including size of the drive and bytes free.

**SysDriveMap** Reports drives which are accessible or in use, including redirected drives.

**SysFileTree** Finds files that are equal to the filespec, wildcards are included.

**SysFileSearch** Finds lines in a specified file.

**SysMkDir** Creates a specified directory.

## Example of SysFileTree

**SysFileTree (filespec, stem,  
[OPTIONS],[TATTRIB],[NATTRIB])**

p1072616

---

Figure 4-9. File Tree Example

***Function: SysFileTree***

- filespec The filespec to search for.
- stem The name of the stem variable to place the results.  
Note: stem.0 contains the number of files and/or directories found.
- options Search for files or directories
- tattrib The target attribute mask used when searching for filespec matches.
- nattrib The new attribute mask which will be used to set the attributes

**SysCreateObject**

**SysGetEa**

**SysIni**

**SysPutEa**

**SysQueryClassList**

**SysSetIcon**

p1072618

---

Figure 4-10. More Functions

The RexxUtil external REXX function package provides a number of functions that permit manipulation of objects on the Desktop, as well as INI file information and Extended Attributes. It is possible to create folders, program objects, program groups and a number of other objects as well. Enhancements since the general release of OS/2 also provide for destroying and changing of objects on the Desktop. These routines provide the user with means of dynamically altering the Desktop. Because these functions are in an external function package, they must be registered to the system prior to use, the same as previous functions studied.

## Example of SysQueryClassList

```
CALL SysQueryClassList "List."  
DO i = 1 to list.0  
      SAY 'Class' i 'is' list.i  
END
```

p1072620

---

Figure 4-11. Query List

The Syntax for the function SysQueryClassList would look like this:

```
call SysQueryClassList stem
```

The stem variable is where the entire set of registered classes is placed. Remember the purpose is to retrieve the complete list of registered object classes.

What kind of loop is being used? \_\_\_\_\_

## Example of SysCreateObject

**RESULT = SysCreateObject(classname, title,location,  
<Setup>,<option>)**

p1072622

---

Figure 4-12. Create Object

This RexxUtil function can be used to create various objects, like folders, programs and shadows, in the Workplace Shell using Rexx.

<b>Classname</b>	The classname determines what kind of object is to be created in the shell.
<b>Title</b>	The name to be displayed for that object.
<b>Location</b>	The location on the Desktop of where the object will be placed.
<b>Setup</b>	Setup specifications ie. the object can be deleted or not, dragged or not dragged.
<b>Option</b>	The action taken if the object already exists, Fail,Replace or Update.

## Example of SysGetEa

**RESULT = SysGetEa(file,name,variable)**

p1072624

---

Figure 4-13. Get EAs

The syntax of the function *SysGetEA* looks like this:

- Syntax: `result = SysGetEA(file, name, variable)` where:
  - file is the file containing the extended attribute.
  - name is the name of the extended attribute.
  - variable is the name of a REXX variable in which the extended attribute value is placed.
  - result is the function result. If the result is 0, the extended attribute has been retrieved and placed in a variable. A non-zero result is the OS/2 return code of the failing function.

## Example of SysIni

**RESULT = SysIni((infile),app,key,val)**

p1072626

---

Figure 4-14. Initialization File

The syntax of the function SysIni has several variations, this is one:

- Syntax - Mode 1: Setting single key value.

```
result = SysIni((infile), app, key, val) where
• result   For successful setting invocations, result will equal "".
• infile   The name of the INI file which you would like to work with.
• app      The application name or some other meaningful value with which you
           would like to store keywords (some sort of data).
• key      The name of a keyword which is used to hold data.
• val      The value to associate with the keyword of the specified application.
• stem     The name of the stem variable to store the resultant information in.
           STEM.0 will be set equal to the number of elements.
```

## ~ Summary

In this topic the student learned additional functions using OS/2 REXX programs.

The student was taught:

- How automate Repetitive Tasks Using Loops
- How to properly use a CALL Statement
- Some of the REXX Utility Functions
- How to use a function in a REXX program to create objects on the Desktop
- How to use REXX to view and change Initialization Files and Extended Attribute Information.

This concludes the topic  
"Introduction to Advanced REXX"

---

## TOPIC 5: OS/2 Video Support

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should understand the OS/2 Video Subsystem.*

*Enabling objectives:*

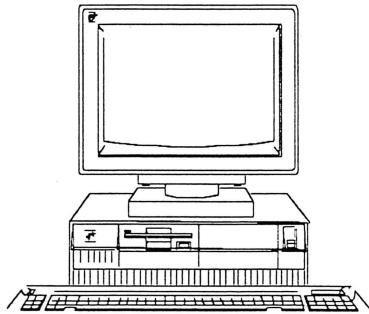
Upon completion of this topic the student should be able to:

- State which adapters are supported by OS/2 and their limitations as applicable.
- Install the adapter support, given a specific customer requirement
- Describe how to configure different types of display adapters such that it can support specific types of applications.
- Identify and solve some common video problems.

**Prerequisite knowledge**

Courses P1070 and P1071 or equivalent knowledge is expected.





## Video Considerations

**- Resolution**

**- Performance**

**- Flicker**

P720204

---

Figure 5-1. Video Considerations

- **Resolution**

Pixels on screen, higher is better, more colours. Require adapter memory (1MB min.)

- **Performance**

More VRAM the better, hardware assistance, eg. Busmaster or Windows accelerator.

- **Flicker**

Interlaced vs. Non-Interlaced.

When choosing a monitor it is important to consider what type of video adapter card to select. The adapter must be able to support the modes your screen is capable of displaying, and vice versa.

P720206

## Video Resolutions

	MONO	
(16 bit)	CGA	ATI 28800 Chips & Technologies VGA chip
	EGA	Everex VGA chip Genoa GVGA chip
	VGA	Western Digital 9010 (512KB) Western Digital 9030 (1 MB) Western Digital 90C31
	8514/A	S3 (86C801/805, 911, 928) Oak OTI-067 Oak OTI-037
(32 bit)	XGA	RealTek
	XGA-2	Trident 8800 chip Tseng ET3000 VGA chip Tseng ET4000 chip Tseng ET4000 & Sierra RAMDAC
	<b>SVGA</b>	Video 7 VGA chip (various)

Figure 5-2. Video Resolutions

IBM Operating System/2 supports all listed video resolutions. Device Drivers for older resolutions (CGA and EGA) are 16 bit drivers, where current modes are supported by 32 bit drivers.

SVGA modes are supported by OS/2 but there are still no real standards, despite ongoing work by the Video Electronics Standards Association (VESA). IBM provides device driver support for chipsets used in their SVGA PC's, S3 86C801/805 chipset. Generic drivers are available for OEM adapters and manufacturers can obtain this source code to further develop specific drivers for their chips and adapters.

Expect updates, new drivers, and better standards.

## ***OS/2 Video Support Components***

- Base Video Handlers
- Video Virtual Device Drivers
- Presentation Manager Display Drivers
- WIN-OS/2 Display Drivers

P720210

---

Figure 5-3. OS/2 Video Support Components

There are four main components of Video Support in OS/2 2.x. Together they provide video support for OS/2 Full Screen and Presentation Manager (PM) applications, DOS and Windows applications, both Full Screen and Seamless modes.

We will address each of these individually.

## **Base Video Handlers**

### **- Handles mode switching**

### **- Text Support (FS & PM)**

### **- Dynamic Link Libraries**

SET VIDEO\_DEVICES=VIO\_VGA

SET VIO\_VGA=DEVICE(BVHVGA)

### **- Compound Video Support**

SET VIDEO\_DEVICES=VIO\_8514A

SET VIO\_8514A=DEVICE(BVHVGA,BVH8514A)

### **- Multiple Adapter Support**

SET VIDEO\_DEVICES=VIO\_8514A,VIO\_VGA

SET VIO\_8514A=DEVICE(BVHVGA,BVH8514A)

SET VIO\_VGA=DEVICE(BVHVGA)

P720212

---

Figure 5-4. Base Video Handlers

*Base Video Handlers (BVH):*

- **Mode Switching** - Switches between Full Screen and Windowed sessions.
- **Text Support** - Handles text for FS and PM. applications.
- **Dynamic Link Libraries** - DLL's loaded from CONFIG.SYS at BOOT time.
- **Compound Support** - DLL's build upon each other.
- **Multiple Adapters** - Primary and Secondary adapters.

*NOTE:* The first adapter specified in VIDEO\_DEVICES is Primary.

## Video Virtual Device Drivers

- Support for DOS Applications
- Hardware Virtualization
- Loaded by CONFIG.SYS  
DEVICE=C:\OS2\MDOS\VVGA.SYS
- Multiple Adapters/Extended Modes  
DEVICE=C:\OS2\MDOS\VVGA.SYS  
DEVICE=C:\OS2\MDOS\VSVGA.SYS
- VVGA.SYS vs VSVGA.SYS  
Remember: SVGA ON

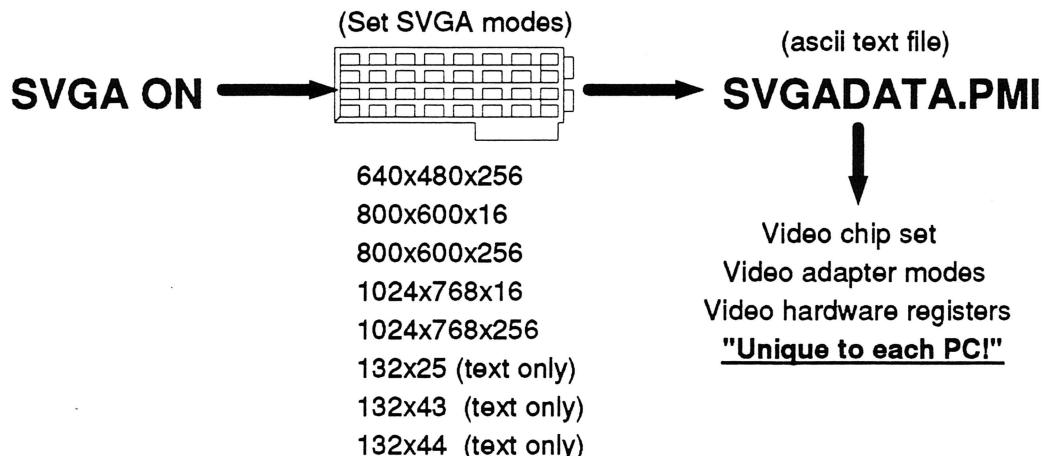
P720214

---

Figure 5-5. Video Virtual Device Drivers

- **Support DOS Applications**  
Video VDD's control DOS Applications' access to video hardware.
- **Hardware Virtualization**  
Hardware Virtualization is the process of the Video VDD emulating access to the video hardware so a DOS application can continue to execute in background mode.
- **Loaded by CONFIG.SYS**  
Video VDDs are loaded from CONFIG.SYS.
- **Multiple Adapters/Extended Modes**  
OS/2 supports installation of multiple Video VDD's. One DEVICE = statement per adapter.
- **SVGA ON Command**  
The VSVGA.SYS driver operates exactly like the VVGA.SYS until you execute the **SVGA ON** command.

## Super Video Graphics Array (SVGA)



P1072216

Figure 5-6. Super Video Graphics Array (SVGA)

Using the **SVGA ON** command:

- Cycles adapter through supported modes
- Reads video hardware register information
- Hardware register information written to **SVGADATA.PMI**

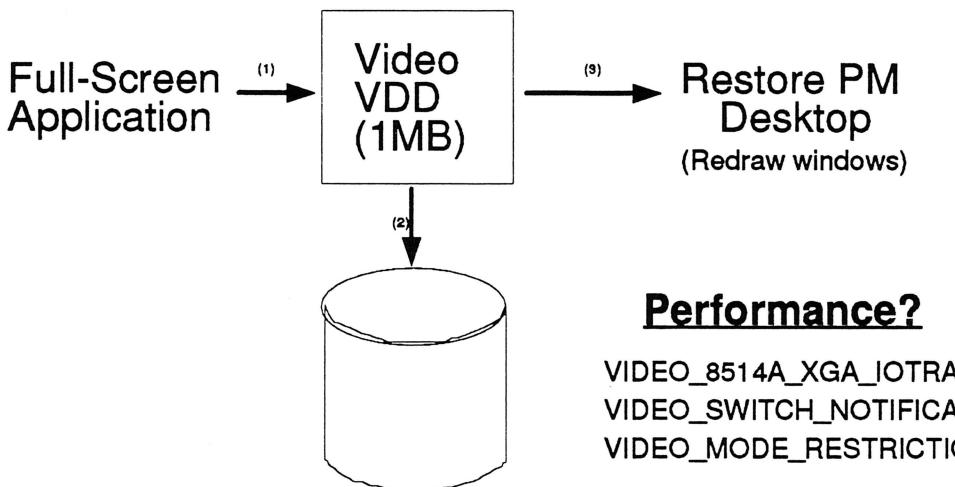
Video VDD use **SVGADATA.PMI**.

**SVGADATA.PMI** contains the following:

- Video Chip Set of adapter (on board)
- Video adapter modes supported
- Video Hardware register values for each mode.

**NOTE:** **SVGADATA.PMI** is unique to each PC. Do not copy to another.

## Full-Screen to PM Applications



### Performance?

VIDEO\_8514A\_XGA\_IOTRAP  
VIDEO\_SWITCH\_NOTIFICATION  
VIDEO\_MODE\_RESTRICTION

P1072218

Figure 5-7. Full Screen to PM Applications

The process OS/2 executes to switch from DOS Full Screen to PM window applications can affect performance and under certain circumstances indirectly cause screen corruption.

1. Video VDD saves copy of screen buffer
2. Screen buffer saved to SWAPPER.DAT (Up to 1MB)
3. Control passed to Presentation Manager Display Driver.

This entire process can impact performance. To fine tune, adjust the following DOS Settings if applicable to your situation:

- VIDEO\_8514A\_XGA\_IOTRAP
- VIDEO\_SWITCH\_NOTIFICATION
- VIDEO\_MODE\_RESTRICTION

## **PM Display Driver**

- OS/2 32 bit Graphics Engine
- DOS & OS/2 Full-Screen (windowed)
- DOS Applications;
  - Video VDD holds screen
  - VIDEO\_WINDOW\_REFRESH
- OS/2 Full-Screen Applications;
  - Use special BVH, BVHWNDW.DLL
- NB: DISPLAY.DLL changed

P1072220

---

Figure 5-8. PM Display Driver

- 32 bit Graphics Engine
- DOS and OS/2 Full Screen
- DOS Applications; Video VDD
- OS/2 FS and BVHWNDW.DLL
- NOTE: DISPLAY.DLL

## WIN-OS/2 Display Drivers

- Full-Screen & WIN-OS/2 Window
- All recognized video adapters
- **Full-Screen WIN-OS/2**
  - Can use MicroSoft Windows drivers
  - Manual install: \WINOS2\SYSTEM
  - Update SYSTEM.INI
- **WIN-OS/2 Window (Seamless)**
  - Special Device Driver
  - Constant updates affect performance

P1072222

---

Figure 5-9. WIN-OS/2 Display Drivers

- *Windows Applications* - Run Full Screen or in a window on the Desktop.
- *OS/2 Support* - For all recognized adapters.
- *Full Screen WIN-OS/2* - Use MS Windows 3.1 drivers.
- *WIN-OS/2 Seamless* - same as DOS VVDD's.

# Video Installation Procedure

- Initial Installation

- Installation Tools

- Diskette Installation
- Preinstalled Systems

- DSPINSTL Utility

- Fonts "NOT" updated

- Manual Update

- NOT Recommended!

P1072224

---

Figure 5-10. Video Installation Procedure

- Initial install defaults to VGA (for SVGA adapters)
- Diskette Install vs. PreInstalled System
- DSPINSTL Utility - Quick change utility.
- Manual Update - Possible but **NOT** recommended.

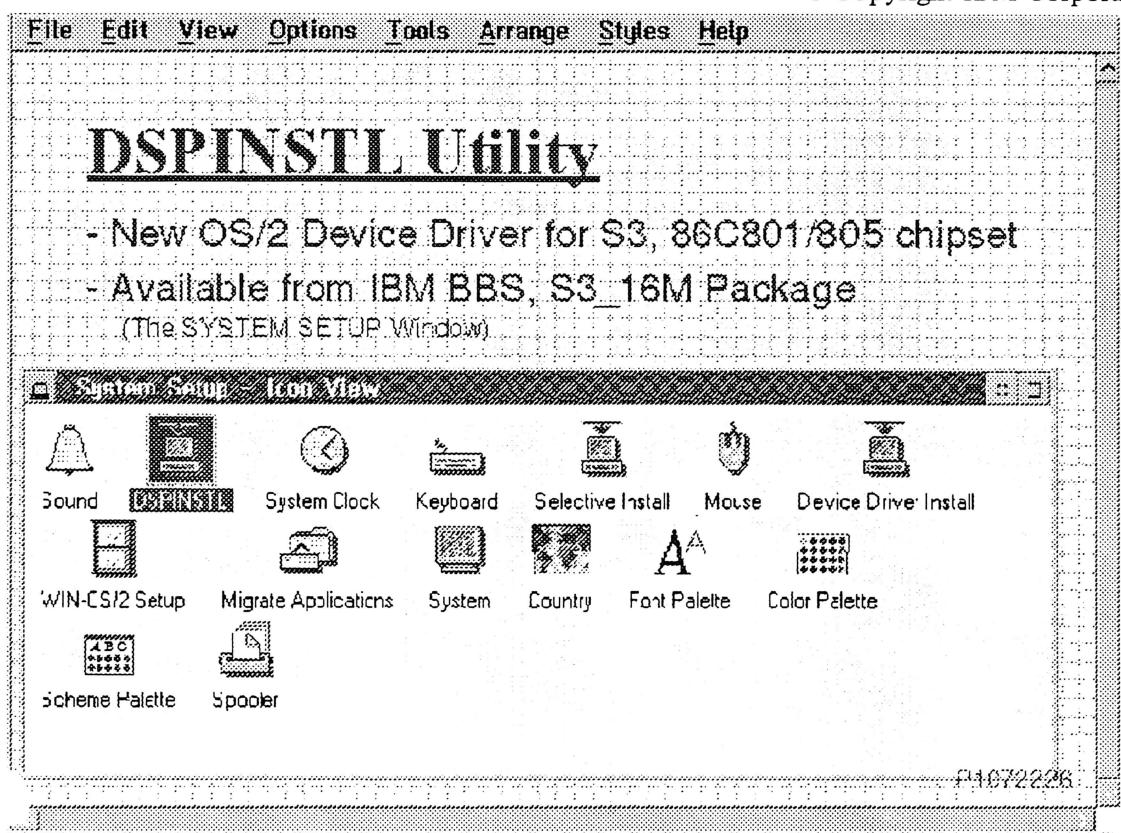


Figure 5-11. DSPINSTL Utility

The **DSPINSTL** Utility is used after the initial installation. It allows you to change ONLY the Display device drivers. After selecting the Primary and Secondary displays and the display adapter mode, you are presented with a list of display types. When you select the adapter type the appropriate display device drivers are copied.

Beware: DSPINSTL only updates the display device driver and does not update the display fonts. If you are not sure if the correct fonts are already on your system, use the "Selective Install" procedure.

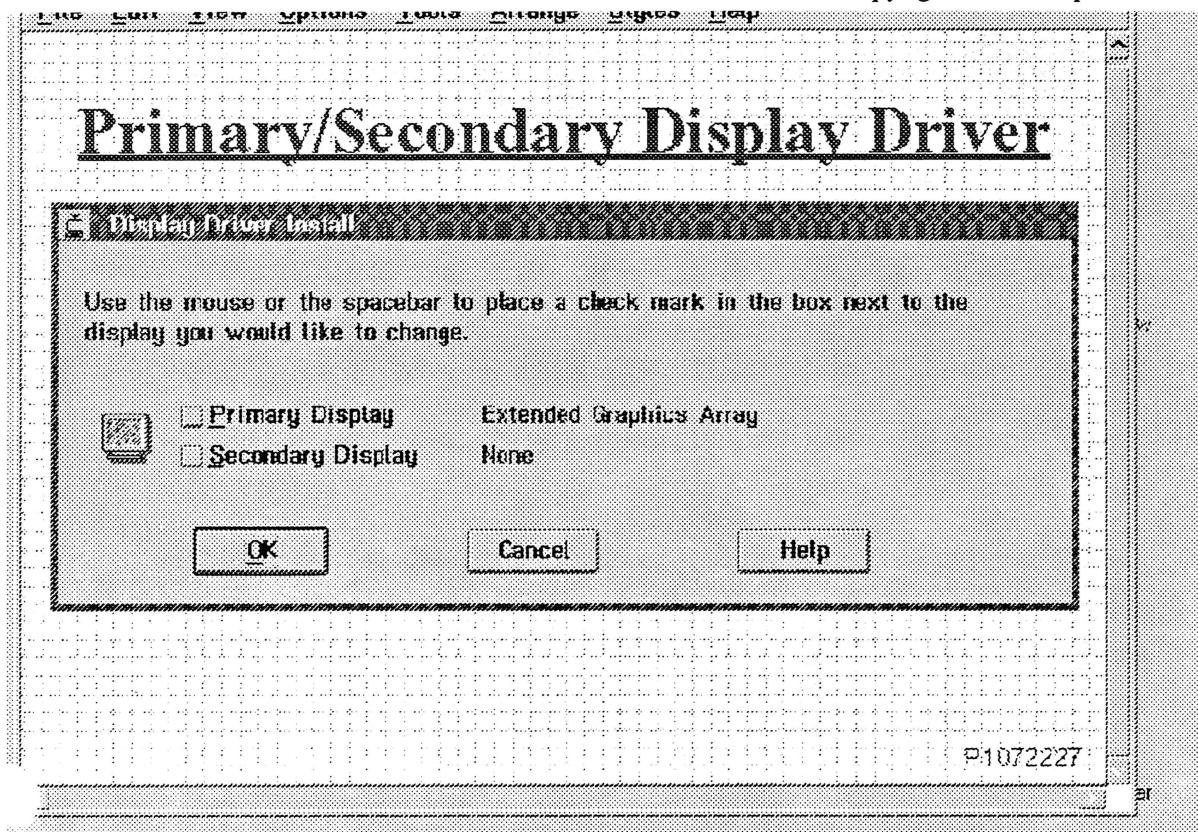


Figure 5-12. Display Driver Install Window

From this Display Driver Install window you select to modify the Primary Display or the Secondary Display. Then you will be presented with a list of adapters to select from.

See next page; "Supported SVGA Adapter Types".

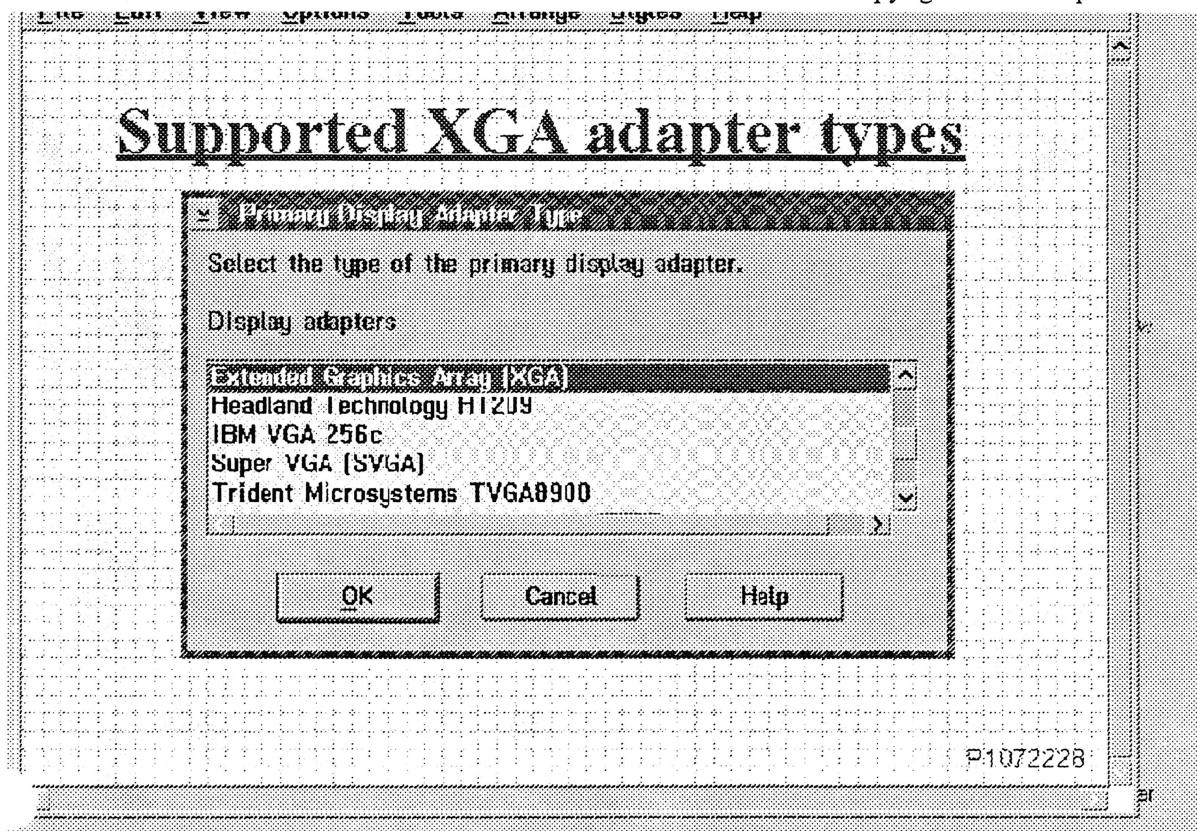


Figure 5-13. Supported SVGA Adapter Types

From the Primary Display Adapter Type window you select the correct adapter type for your system. When you press OK, OS/2 continues with the device driver installation and prompts you on the screen with necessary instructions.

## ***SVGA Cosiderations***

- SVGA Installation (DOS based)

- SVGA cards have DOS based utility
- DOS support not initially installed

- Change Adapters or Recovery

### **SETVGA drive (/P)**

- Reset Video Support to VGA
- Used to recover from incorrect install

P1072230

---

Figure 5-14. SVGA Considerations

SVGA support is installed in two steps. Because most SVGA adapters use a DOS based install utility, OS/2 only installs font support during the initial install. You must then execute the DSPINSTL Utility which allows you to select either a "default install" or "Install from a supplied utility."

If you want to change adapters that use higher resolutions than VGA or you need to recover from corrupted files or an incorrect install you can use the SETVGA program.

**NOTE:** On pre-installed systems do not forget the "/P" switch, for example:  
**SETVGA d: /P**

If recovering from a bad install or corrupt files: boot from the

1. Boot from the OS/2 Installation Diskette and Diskette #1,
2. ESC to the command prompt,
3. Change to the \OS2 sub-directory on the install drive.

Device Drivers for the S3 chipset are available from the IBM BBS. The README.S3 file contains installation instructions and other details. This README file is reproduced as an Appendix in this notebook.

## Video Display Driver Summary

Type	Purpose	VGA files	Location
Base Video Handler	Full-Screen OS/2	BVHVGA.DLL BVHWNDW.DLL	SET VIO_VGA in CONFIG.SYS
PM Device Driver	PM Sessions	IBMVGA32.DLL IBMDEV32.DLL	OS2.INI file
DOS	VDM's	VVGA.SYS	device= CONFIG.SYS
WIN-OS/2 Full-Screen	Full-Screen WIN-OS/2	VGA.DRV	display.drv= of file \OS2\MDOS\WINOS2 SYSTEM.INI
WIN-OS/2 Seamless	Seamless WIN-OS/2	SWINVGA.DRV	display.drv= of file \OS2\MDOS\WINOS2 SYSTEM.INI

P1072232

---

Figure 5-15. Video Display Driver Summary

This chart depicts the different files required to support one display mode. It indicates the type of support, what the support is for, the file names of each Dynamic Link Library or Device Driver, and where the appropriate entry or pointer is.

There would be equivalent files for any other screen mode, eg. SVGA or XGA. This is especially helpful if you are ever in a position where you might want to attempt manual changes or updates to the video system of OS/2.

## Common Video Problems

- Changing Resolutions
- Monitor Flicker
- Poor SVGA Performance
- CD-ROM Display Drivers
- SETVGA with CD-ROM
- Matching Fonts
- OEM Video Drivers

**P1072234**

---

Figure 5-16. Common Video Problems

- ***Changing Resolutions*** - Know the differences among Install Utilities. Additional information on in the OS/2 2.1 Technical Update Redbook.
- ***Monitor Flicker*** - Interlaced vs. Non-Interlaced. Additional information, in the OS/2 2.1 Technical Update.
- ***Poor SVGA Performance*** - Video Hardware assistance and minimum 1 MB VRAM. Eg, S3, XGA, and 8514 adapters.
- ***CD-ROM*** Remember path: x:\OS2SE21, where x = CD-ROM drive.
- ***SETVGA with CD-ROM*** - Execute RSPDSPI manually.
- ***Matching Fonts*** - Remember, DSPINSTL only installs drivers.
- ***OEM Video Drivers*** - Vendor Instructions and support.

---

## **TOPIC 6: OS/2 Support and Services**

### **Topic objectives**

*Terminal objective:*

*After attending this topic the student should be able to list services and support to which they have access to for OS/2 2.1.*

*Enabling objectives:*

Upon completion of this topic the student should be able:

- List available BBSs that discuss OS/2
- State some of the OS/2 services available
- State some of the OS/2 support available
- List some of the publications that are available pertinent to OS/2



## **OS/2 Product Support**

**1- 800 - 992 - 4777**

**must have valid registration number**

**60 days free technical support**

**p1072400**

---

Figure 6-1. OS/2 Product Support

When you license IBM's OS/2 2.1, you receive 60 days of *free* technical support. Use the OS/2 on-line and hardcopy information, that comes with OS/2, as your first source for solving problems. Then, if you require further assistance with installing, setting up, and operating OS/2 2.1, contact this number.

The following are mini applications and productivity aids that *are* serviceable and warranted:

- Productivity Folder
  - Clipboard Viewer
  - Enhanced Editor
  - Icon Editor
  - OS/2 System Editor
  - Picture Viewer
- MMPM/2
  - Compact Disc
  - Volume Control
  - Digital Audio

- Digital Video
- MIDI
- Multimedia Data Converter
- Multimedia Setup
- Multimedia Install
- Sound effect files (.MID and .WAV)

## OS/2 Services

- **OS/2 Support Line**
- **SYSTEMXTRA**
- **OS/2 Developer Assistance Program**
- **IBMLink**
- **OS/2 Technical Conferences**

p1072402

---

Figure 6-2. OS/2 Services

- ***OS/2 Support Line***
  - Is a 12 month subscription
  - Is an annual fee
  - Individual Support (one single user)
  - Topics supported range from Installation to usage assistance
- ***SYSTEMXTRA***
  - Single point of contact
  - Immediate access to an expert
  - Support topics such as Installation, Configuration and Performance tuning
- ***OS/2 Developer Assistance Program***

Intended for the professional developer. It is intended to assist companies in developing OS/2 applications by informing them of related services, products, conferences and, education. It provides Technical support for OS/2 development via the CompuServe Forums.
- ***OS/2 Technical Conferences***

Occur every year at various sites across the world. The speakers are often the software developers of the product they are presenting.

## OS/2 Services

- **IBM HelpFax**
- **Satellite TV Updates**

p1072404

---

Figure 6-3. OS/2 Services

- ***IBM HelpFax***

This is an IBM automated fax response system that guides a caller using voice messages. Callers may access the IBM HelpFax system by dialing from a touch tone telephone and then selecting documents or catalogs of documents to be *faxed back* to any fax machine that is convenient to them.

There is *no charge* for the service. It is available 24 hours a day, seven days a week except for brief periods of time when updates are being made.

- When you select a document, it will indicate how many fax pages to expect.
- Topics range from OS/2 to MCA to Technical Tips etc..

The voice prompt will be made in English or French, depending on your request.

Call **1-800-465-3299**, or in Toronto **(905) 316-3299**. Document number 45054 explains IBM HelpFax.

- ***Satellite TV updates***

These consist of technical updates given to customers via satellite TV on the IBM TV Network. There are more than 300 IBM sites throughout the US and Canada that receive these programs. These consist of technical topics ranging

from the Host systems to mid range to Personal Computers. Some topics are OS/2, LAN and, PS/2 systems.

## OS/2 Publications

- Books
- OS/2 Magazines
- OS/2 White Papers
- OS/2 Red Books

p1072406

---

Figure 6-4. OS/2 Publications

- *Books*

Books on OS/2 ranging from End User to Technical Support topics are available from various Bookstores. Some can be ordered through IBM.

- *OS/2 Magazines*

Various OS/2 Magazines exist in the market. The OS/2 Developer G362-001, is a quarterly publication from IBM's US Developer Assistance Program. It contains many articles on a wide variety of OS/2 topics including OS/2, DB2/2, CM/2 and LAN Server.

- *OS/2 White papers*

- OS/2 the bigger picture
- Upgrading to OS/2
- OS/2 2.1 Performance Improvements
- OS/2 Lan Server 3.0 Overview

- *OS/2 Red Books*

Redbooks get their name from the red covers used on the books. These are technical documents published by the IBM Technical Support Centers (ITSC).

## **Bulletin Board Systems**

**- IBM Canada BBS**

**- IBM Raleigh BBS**

**- CompuServe**

**- Internet**

p1072408

---

Figure 6-5. Bulletin Board Systems

Bulletin Board Systems (BBS) are a good way to get more information about OS/2 (technical support, product news, shareware, utilities, etc.). IBM runs a BBS to offer customer support. There are other BBS that have OS/2 information available on them. BBSs offer you:

- Conference with other users
- Technical information
- Today's news through bulletins
- File download capability
- ***IBM BBS***

The IBM BBSs have no charge access. If you are calling from long distance you will have to pay the long distance call, but actual access to the IBM BBS is free.

You will find a variety of forums that deal with OS/2: from installing, supporting and, using other products with OS/2.

Bulletin Board phone numbers:

- IBM Toronto BBS (416) 492-1823
- IBM Toronto Markham BBS (905) 316-4255

- IBM Vancouver BBS (604) 664-6466
- IBM Montreal BBS (514) 938-3022
- IBM Atlanta BBS (404) 835-6600

- *CompuServe Forums*

CompuServe is another well known BBS that offers a large variety of topics pertinent to OS/2 and other products both software and hardware.

On CompuServ to access OS/2 forums, one can request: GO OS2. This will open up four sections that can be opened and browsed further.

## **Topic Summary**

In this topic, the student were given an awareness of some of the services and support that is available for OS/2.

The student learned:

- Some of the OS/2 services available
- Some of the OS/2 support available
- Some of the available OS/2 publications
- Two available BBSs that discuss OS/2

This concludes the topic  
"OS/2 Support and Services."



---

## **TOPIC 7: OS/2 Maintenance and Recovery**

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should be able to exercise Maintenance and Recovery procedures for OS/2.*

*Enabling objectives:*

Upon completion of this topic the student should be able to:

- Identify and use available documentation for problem determination.
- Describe, obtain and use additional tools to solve problems.
- Describe and performINI file recovery.
- Create and use emergency boot disk or maintenance drive which include tools needed for commonly encountered errors.
- Identify the steps in the boot up process.

**Prerequisite knowledge**

No previous problem determination skills are required to attend this topic.



## *Hard Copy Documentation*

## *Shipped with OS/2*

- Installation Guide**
  - Appendix B. Diagnosing System Problems**
- Using the Operating System**
  - Chapter 24. Solving Problems**
  - Appendix B. Error Messages**
  - Appendix G. Recording Information**

p1072800

---

Figure 7-1. Hard Copy Documentation

Shipped with OS/2, is the Installation Guide and Using the Operating System. These references contain invaluable information needed to support other people.

Using the Operating System has extensive information on problem solving, printer, video and hardware problems.

## ***Soft Copy Aids:***

### **Supplied**

- Master Help - Problem Determination
- Command Ref. - Problem Determination

### **Also available**

- PS/2 Assistant (PS2ASST)
- Frequently Asked Questions (FAQ)

### **INF format**

- VIEW.EXE
- Set Bookshelf

p1072802

---

Figure 7-2. Softcopy Aids

Master Help Index - Problem determination topics through Hyper links to specific problems.

Command Reference - Contains specific cases, such as video device information.

The README file, located in the information folder, contains information about devices and applications not included in other on-line help.

Tips and Techniques - Is a document available for OS/2 which contains data on support issues and is available on the IBM BBS.

PS/2 Assistant - Is also available on the IBM BBS and is in the INF format.

Frequently asked questions or FAQ - contains about 100K of Q's and A's in INF format.

The VIEW program displays selected \*.INF files and provides highlighted text searches, bookmarks, etc. These INF files are created using the OS/2 Programmer's Toolkit. Examples of files that are used with VIEW are: Command Reference, OS2FAQ, the PS/2 Assistant, and Tips and Techniques.

## Configuration Aids:

- QCONFIG - BBS

- PSTAT command - PM version of this in BBS

- SYSLEVEL command

- Pre-Load Systems only

**SYSINFO  
Services (Helpware)**

p1072804

---

Figure 7-3. Configuration Aids

**QCONFIG** - This is a tool which displays system configuration data and hardware information.

**PSTAT** and **SYSLEVEL** - Are OS/2 commands and are apart of the operating system. Refer to the on-line Command Reference for usage information .

**SYSINFO** and **HelpWare\*** - Are supplied on pre-loaded OS/2 2.0 and 2.1 systems.

The System Information Tool (SYSINFO) is a PM application designed to gather and display a variety of information about the hardware and software configuration of your system. The program is primarily designed for use on PS/1 and PS/2 systems, but many features will function on systems from other vendors.

**Service** - Is another INF file containing information about HelpWare, an IBM service offering.

## ***Problem Determination Commands:***

**- AUTOFAIL**

**- CREATEDDD**

**- PATCH**

**- SYSLOG**

**- TRACE**

**- TRACEFMT**

p1072818

---

Figure 7-4. Problem Determination Commands

- AUTOFAIL - Displays system error information. (ON | OFF )
- CREATEDDD - Creates a dump diskette for use with the Stand-Alone Dump procedure.
- PATCH - Allows you to apply IBM-supplied patches to make repairs to software.
- SYSLOG - Starts or stops adding system event information to the System Log file.
- TRACE - Sets or selects system tracing for system events.
- TRACEFMT - Displays formatted trace records if the TRACE facility has been set.

## **Recovery Tools:**

<b><u>OS/2 Supplied</u></b>	<b><u>Available</u></b>
<b>BACKUP</b>	<b>TINYED</b>
<b>RESTORE</b>	<b>SHFTRN</b>
<b>RECOVER</b>	<b>BOOT2X</b>
<b>CHKDSK</b>	
<b>XCOPY</b>	<b>WPSBK8</b>
<b>MAKEINI</b>	<b>EDITINI</b>

p1072806

---

Figure 7-5. Recovery Tools

- BACKUP - Backs up (copies) one or more files from one disk to another.
- RESTORE - Restores one or more backed-up files from one disk to another.
- RECOVERY - Recovers files from a disk that contains defective sectors.
- CHKDSK - Analyzes directories and files, determines the file system type, and produces a disk status report. CHKDSK also displays the volume label and volume serial number of the disk.
- XCOPY - Selectively copies groups of files, which can include lower-level sub-directories.
- MAKEINI - Is a utility that can be used to create new INI files if the ones being used by the system have become corrupted.

All tools in the "Available" column are obtained from the IBM BBS.

## INI Files:

### - Contents

### - Problems

### - Recovery techniques

p1072808

---

Figure 7-6. INI Files

- ***OS2SYS.INI***

The OS2SYS.INI file contains system defaults for the Workplace Shell. It contains information about objects such as communication ports, printers, displays, memory, the spooler and window characteristics.

- ***OS2.INI***

The OS2.INI file contains user information about currently running program objects; shadowed/copied objects; program reference objects; palette objects; disk objects; folder positions; and program associations and types.

**What If** These files get corrupted? INI file corruption will result in a loss of information used to build the Desktop. Therefore, it is recommended that backups of these files be taken. In OS/2 2.0 these files were always kept open, making it difficult to copy them. Copies could be taken by booting the system from diskette or putting a call command in the config.sys before the INI files are opened. With OS/2 2.1 the INI files are closed, and opened periodically for updating. Because of this new approach it is possible to copy the INI files at any time.

Three Recovery Approaches:

1. A backup history, using the STARTUP.CMD

2. The magic key combination, ALT + F1
3. The MAKEINI command utility

## Workplace Shell Objects

### Problem Determination Criteria:

Object	Object Location	Properties
Folder	File system	EAs
Data file	File system	EAs
Program file	File system	EAs
Program file reference	Transient	OS2.INI
Shadow	Transient	OS2.INI original

p1072810

---

Figure 7-7. Workplace Shell Objects

If an object appears corrupted, the problem is either in the extended attributes or the INI files. The above chart shows which objects have extended attributes and which do not. This could be a first step in problem determination.

With the FAT file system, EA's are held in one file called EADATA.SF. This is a hidden file in the root directory. With HPFS the EA's are kept with the file and can be seen as the second column of numbers. Information lost from these attributes could be, for example, a reason an object on the Desktop has lost its ICON.

## **Maintenance:**

### **- BOOT2X**

- Minimal**
- PM**
- WPS**

### **- One Diskette boot**

- files to be deleted**
- additional files required**

p1072812

---

Figure 7-8. Maintenance

BOOT2X - Also known as BOOTOS2, is available on the IBM BBS. This program can be used in three different ways.

1. Create a minimal OS/2 system on diskette or on a hard drive. This will allow OS/2 to run full screen with no Presentation Manager or Workplace Shell programs.
2. Create a Presentation Manager version of OS/2 which will allow programs like the System Editor or Enhanced Editor to run.
3. Create a scaled down Workplace Shell or WPS version with drag and drop capability.

In order to create a single boot diskette there are files that need to be added and other files that can be removed. Although the BOOTOS2 program can create a single boot diskette, it is of interest to discover what files are necessary for this diskette. Also a boot diskette created on one machine may not work on another machine. The reason for an Installation Diskette and Diskette One is to load all the possibilities for hardware support.

## Summary

In this topic the student learned Maintenance and Recovery procedures for OS/2.

The student was taught to:

- Identify and use available documentation for problem determination.
- Describe, obtain and use additional tools to solve problems.
- Describe and perform INI file recovery.
- Create and use emergency boot disk or maintenance drive which include tools needed for commonly encountered errors.
- Identify the steps in the boot up process.

:eunit.

---

## TOPIC 8: OS/2 Printing

**Topic objective:**

*Terminal objective:*

*After attending this topic the student should be able to solve OS/2 printing problems.*

*Enabling objectives:*

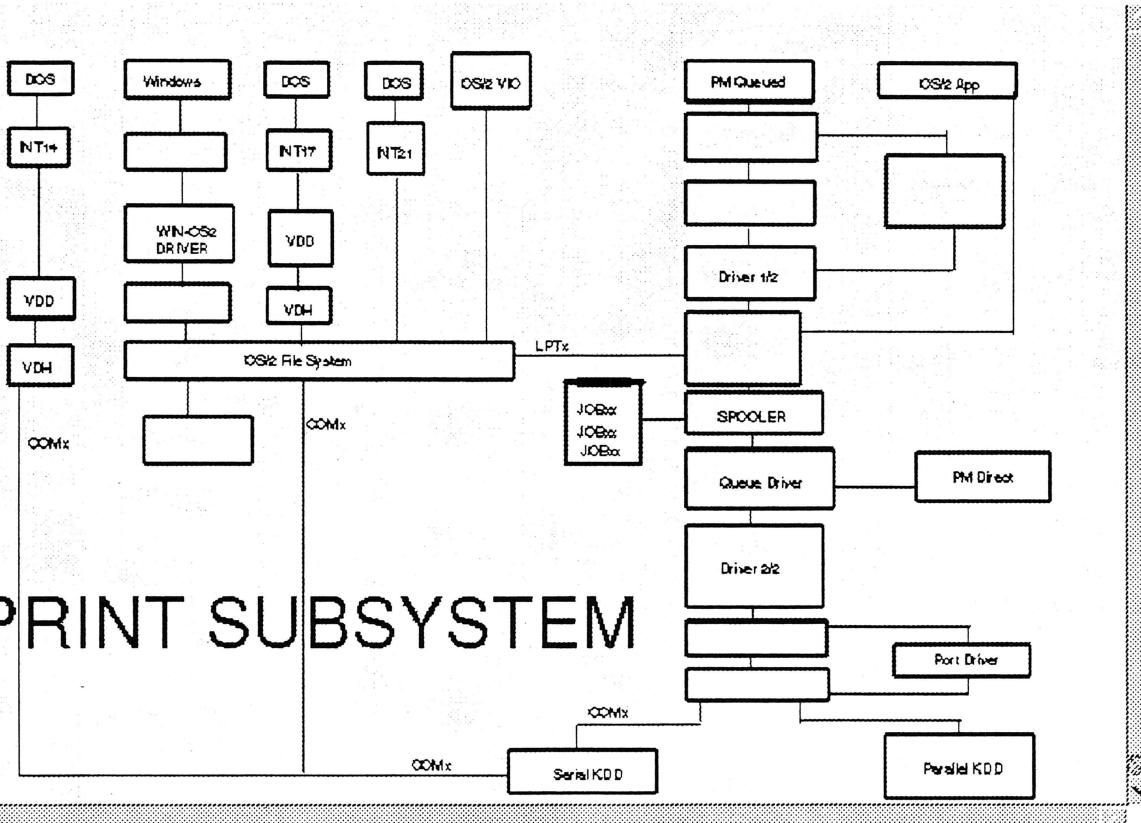
Upon completion of this topic the student should be able to:

- State the components of the Print Subsystem.
- Describe the Print Data Flow for different applications.
- Identify and solve common printer problems.

**Prerequisite knowledge**

Courses P1070 and P1071 or equivalent knowledge is expected.





## PRINT SUBSYSTEM

Figure 8-1. Print SubSystem - Low Level View

A Print Job can take different routes through the OS/2 Print Subsystem depending on:

- TYPE - DOS, WINDOWS, OS2 VIO, or PM
- PM - Queued or Direct (OS/2 Spooler enabled)
- WINDOWS - LPTx or COMx? WIN-OS2 Spooler Enabled
- DOS - LPTx or COMx? INT05, INT14, INT17 or INT21

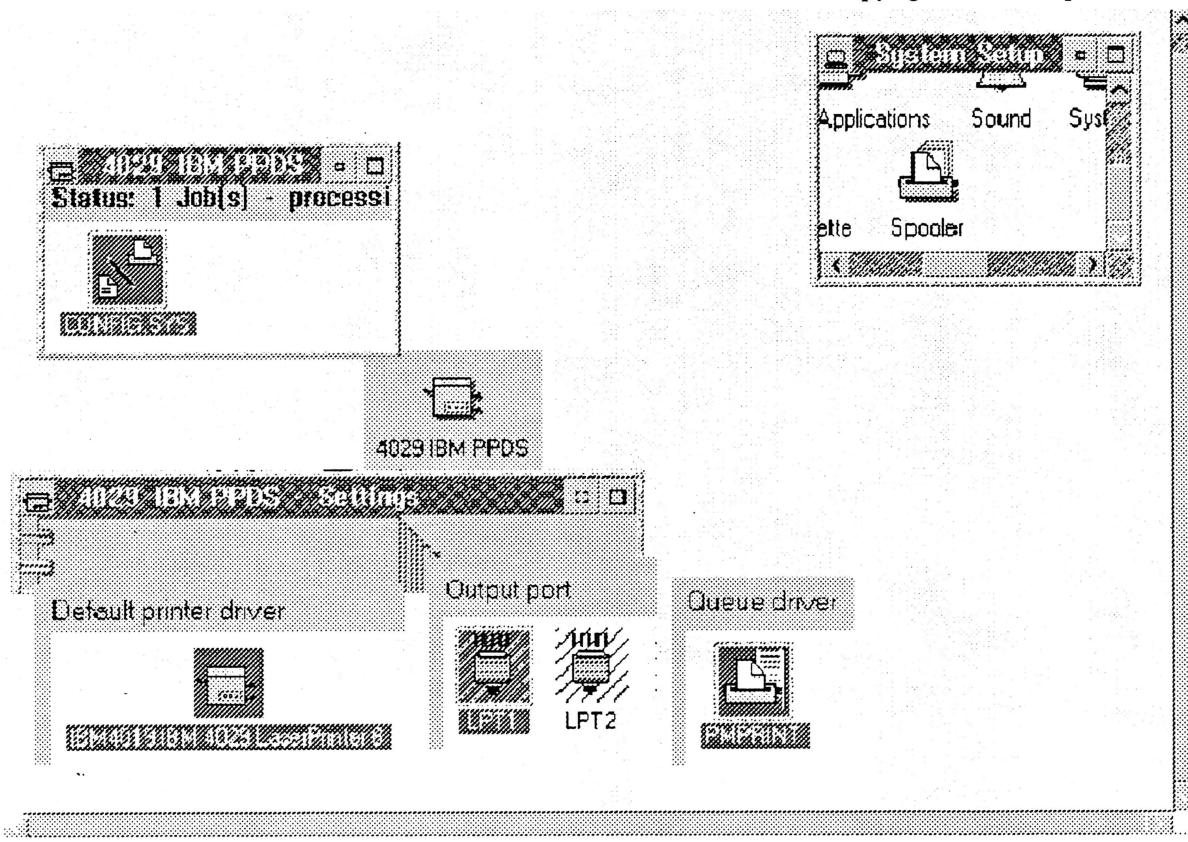


Figure 8-2. OS/2 Print Objects

- **Printer** - configure printer and view print jobs. Each printer object has a single print queue.
- **Printer Driver** - used by OS/2 to create appropriate data stream for the attached printer (eg. IBM4019.DRV, PSCRIPT.DRV, IBMNULL.DRV).
- **Port** - provides print routing (SERIAL.PDR and PARALLEL.PDR).
- **Spool** - keeps the contents of each print job separated from the contents of every other print job (C:\SPOOL).
- **Queue** - pass queued print jobs to the appropriate printer driver to prepare it for printing (PMPPRINT.QPR and PMPLLOT.QPR).
- **Job** - allows for modification of job properties and print job management.

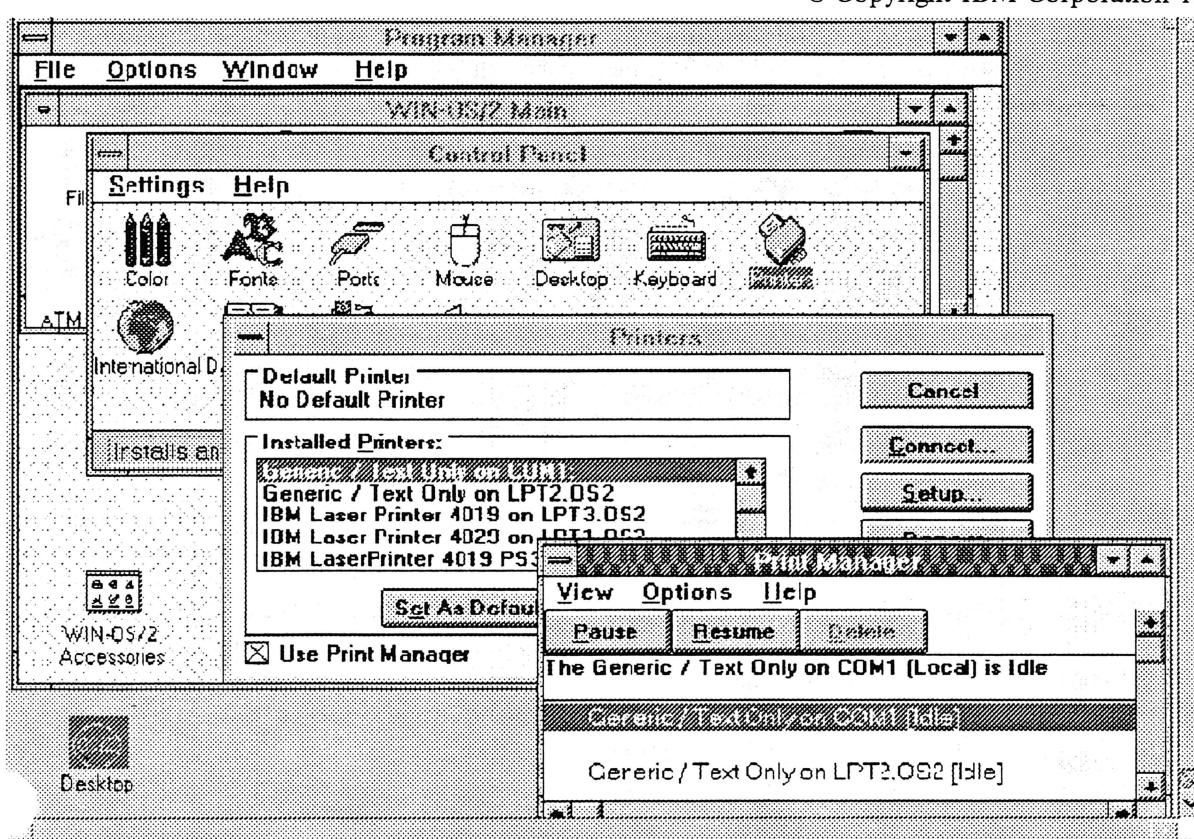


Figure 8-3. WIN-OS2 Printing

- **Control Panel - Printers** - install and configure WIN-OS2 printer drivers. Connect to output ports. Enable WIN-OS2 spooling.
- **Print Manager** - manage WIN-OS2 print jobs and print queues.

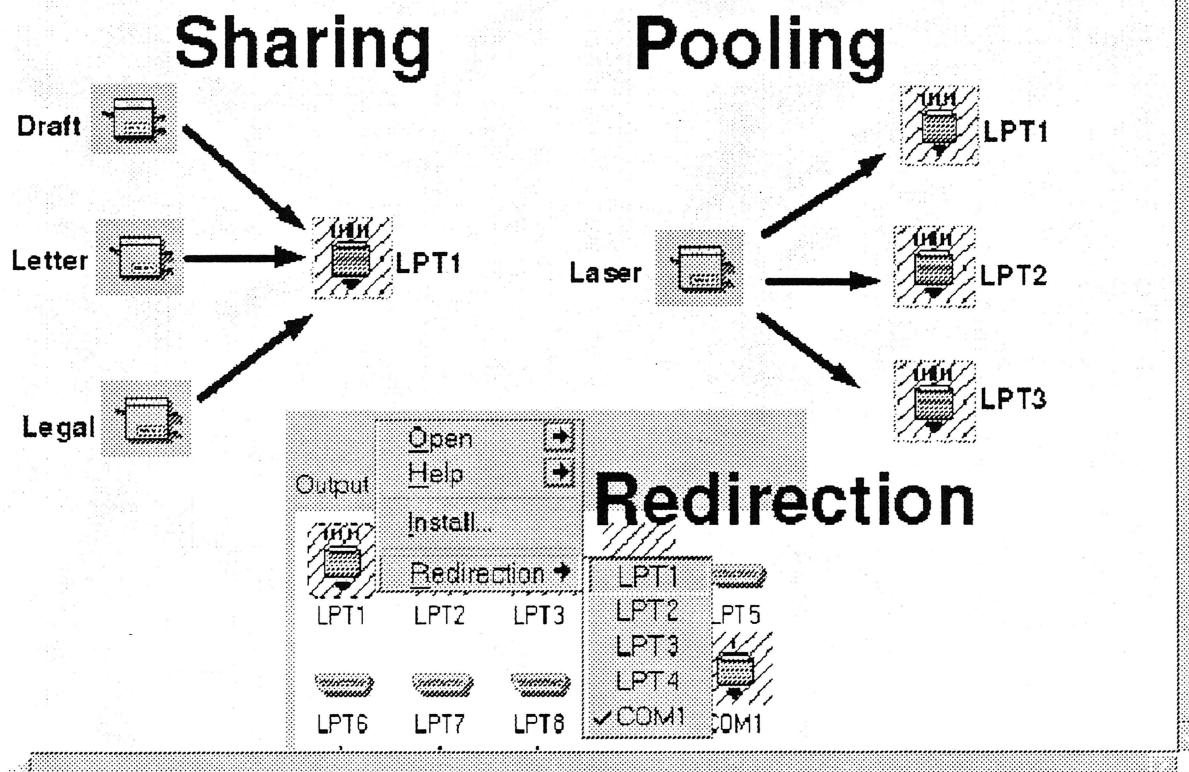


Figure 8-4. Printing Configurations

- **Printer Sharing**

When more than one printer object is assigned to the same port, the result is printer sharing. Printer Sharing allows you to assign different printer and job properties to the same physically attached printer.

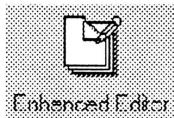
- **Printer Pooling**

When you assign more than one port to a single printer object, the result is pooled printers. This way, jobs waiting to print or plot can be processed through any free port, increasing the number of jobs that can print at the same time.

- **Port Redirection**

Use Port Redirection to redirect non-Presentation Manager print jobs from an LPT port to a printer object associated with a different printer port.

**Program**



Enhanced Editor

## OS/2 Print Data Flow

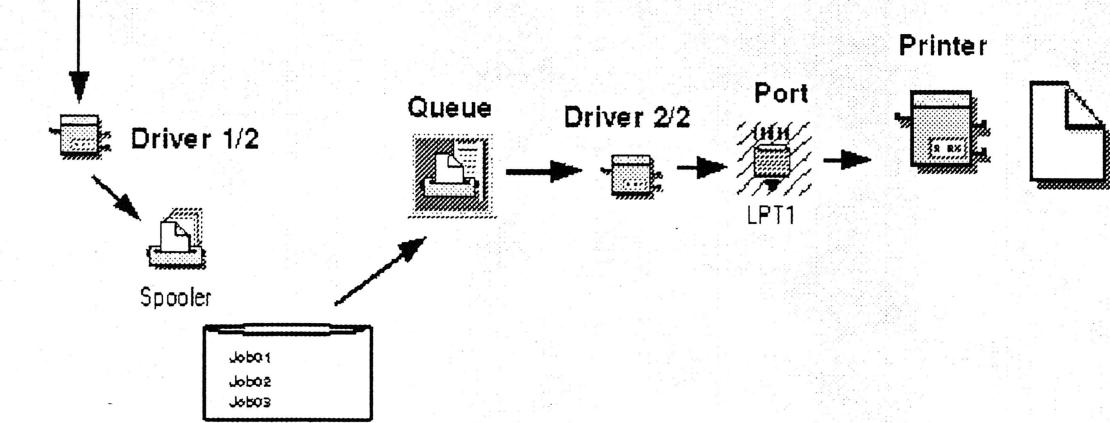


Figure 8-5. Presentation Manager Print Data Flow

**PM Queued Printing** is shown in the above figure and described below:

1. A print data stream (job) is created when a PM Application issues a print.
2. The printer driver adds printer properties and job properties as specified in the default setting. The printer driver also converts the data stream into the correct printer specific format (language) for the specified printer.
3. The spooler writes the print job to the hard disk.
4. The queue driver reads jobs from disk, one at a time, when the printer is free.
5. Printer driver 2/2 completes data stream conversion to printer specific format and adds job properties.
6. The job is then passed to the appropriate physical port for printing.

When the spooler is disabled the data flow is known as **PM Direct Printing**. Driver 1/2, the spooler and the queue driver are bypassed.

Windows Program

WIN-OS2 Print Data Flow

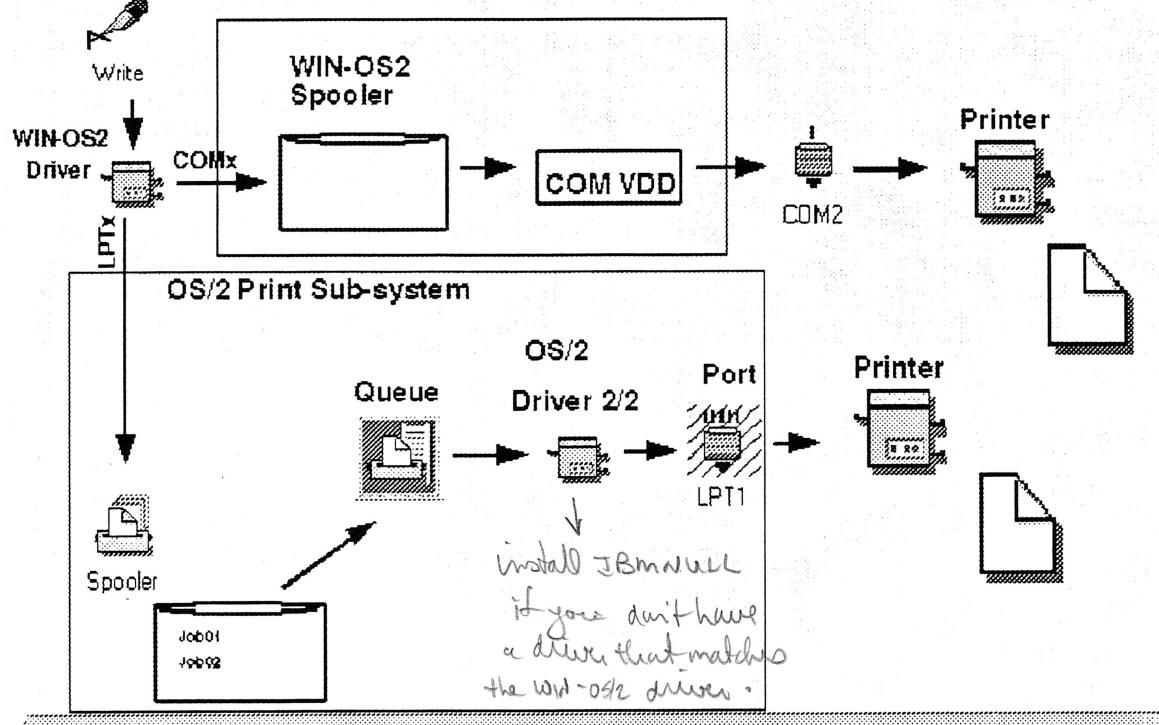


Figure 8-6. WIN-OS2 Print Data Flow

- The WIN-OS2 Driver is used for all WIN-OS2 printing.
- For parallel port printing, the print job flows through the OS/2 Print Sub-system. The OS/2 Printer Driver 2/2 is used and must match the WIN-OS2 driver.
- For serial port printing, the print job is spooled to the WIN-OS2 spooler (if enabled). A virtual serial device driver (VCOM.SYS) is used to access the physical device driver (COM.SYS).

## Non-PM, Non-WIN-OS2 (DOS)

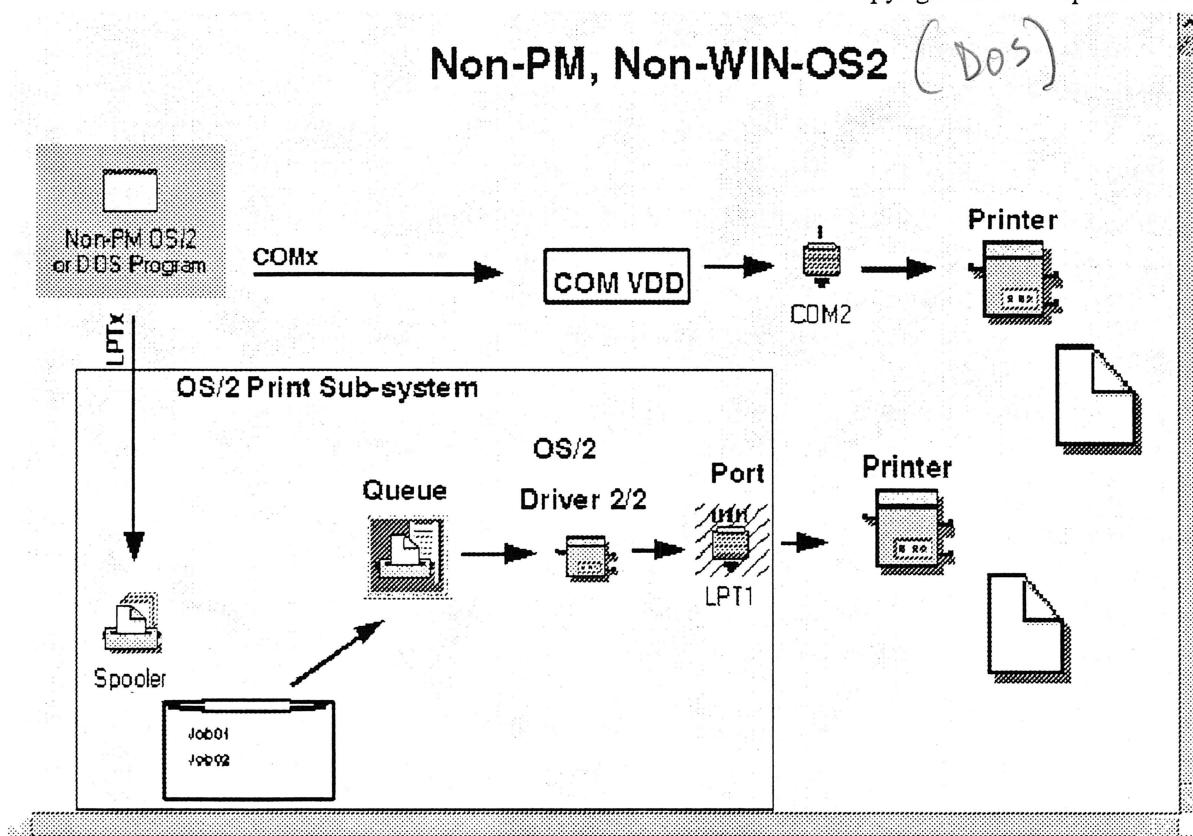


Figure 8-7. Non-PM, Non-WIN-OS2 Print Data Flow

This data flow is used by Non-PM OS/2 applications, commands, DOS applications and, Print Screen.

Some DOS applications will provide their own printer drivers. These should be used.

For parallel port printing, the print job flows through the OS/2 Printer Subsystem.

For serial port printing, the virtual serial device driver (VCOM.SYS) is used to access the physical device driver (COM.SYS).

## CONFIG.SYS

PRINTMONBUFSIZE=2048,134,134

BASEDEV=PRINT01.SYS

DEVICE=C:\OS2\COM.SYS

## SPOOLER

ENABLE/DISABLE

PRINT PRIORITY (1 to 189)

SPOOL PATH (C:\SPOOL)

## WIN-OS2 SPOOLER

USE PRINT MANAGER

Figure 8-8. Printer Subsystem Settings

In addition to the settings shown in the figure, two DOS Settings are available:

- PRINT\_SEPARATE\_OUTPUT = ON
- PRINT\_TIMEOUT = 15

# Print Utilities ...

\* PRNINTST

\* EDITINI

\* 40X9SU33 (Printer Specific)

Figure 8-9. Print Utilities

- *PRNINTST* - Printer Interrupt Test
- *EDITINI* - Edit OS2.INI and OS2SYS.INI
- *40X9SU33* - Supplemental Utilities for the 40X9 Family of Lexmark Printers.

# Printer Support ...

- \* OS/2 Online Help Facilities
  - \* IBM BBS
  - \* UTILITIES
  - \* IBM HelpFax
  - \* REFERENCE
- \* OS/2 Support Line
- \* LexMark Support Line

Figure 8-10. Printer Support

- *OS/2 Online Help* - Start Here for "Printing, Problem Determination".
- *IBM BBS* - drivers, utilities, IPF reference
- *UTILITIES* - PRNINTST, EDITINI, 40X9SU33, 2UP, OS2HELP.ZIP
- *IBM HelpFax* - PRINT.FAX, WINPRINT.FAX, DOSPRT.FAX
- *REFERENCE* - OS/2 Print REDBOOK, Using the Operating System
- *OS/2 Support Line* 1-800-992-4777
- *LexMark Support Line* 1-800-537-2540

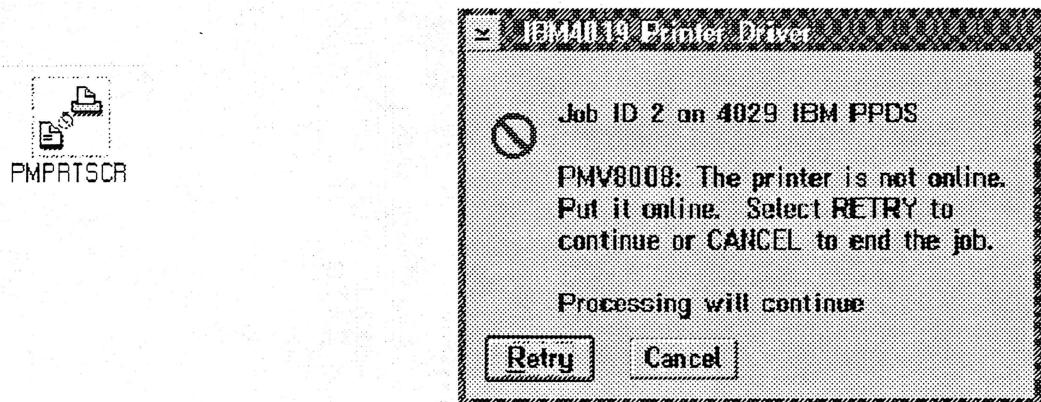
# Printer Problem Determination ...

1. What Changed?
2. Print Elsewhere?
3. None or Incorrect Printout?
4. Type of Data Flow?
5. Expected Route?
6. Distance en Route?
7. Suspect Component?
8. Correct & Test!



Figure 8-11. Problem Determination - General

1. What Changed?  
Recent changes to Hardware? Configuration? Application?
2. Print Elsewhere?  
Test printing from other applications.
3. None or Incorrect Printout?  
No output suggests a hardware problem.  
Incorrect output suggests a printer driver problem.
4. Type of Application/Data Flow?  
Queued PM? Direct PM? WIN-OS2? or Non-PM, Non-WIN-OS2?
5. Expected Route?  
Based on Type of Application, spooler(s) enabled, serial or parallel port?
6. Distance en Route?  
Spooling? Waiting? Held? Printing? Error?
7. Suspect component?  
Based on the distance traveled along the actual print data flow route.
8. Correct & Test!



## No Output Printed

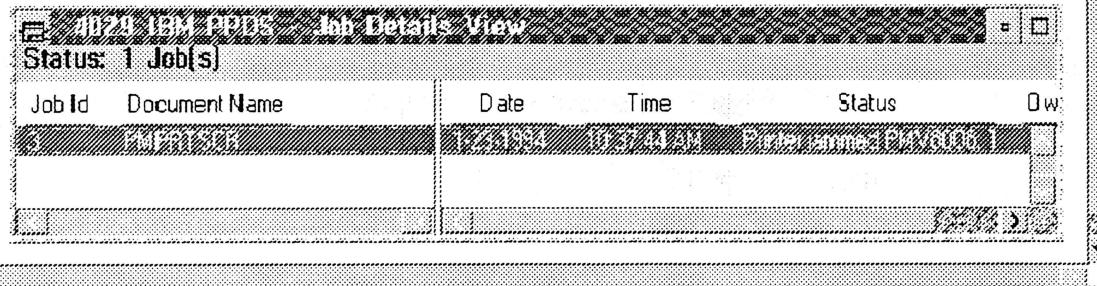


Figure 8-12. No Output Printed

### Description

- User received a "PMV0008: The printer is not online" error message. Nothing prints today, worked fine yesterday.

### Cause

- Hardware. Printer or printer connections.

### Solution or Recommended Action

- Check that the printer or plotter cable is securely connected to both the printer and to the appropriate port on your computer.
- Check the indicator lights on the device to make sure that it is powered on and online (or ready).

# Jobs Prints Incorrectly

© Copyright IBM Corporation 1993

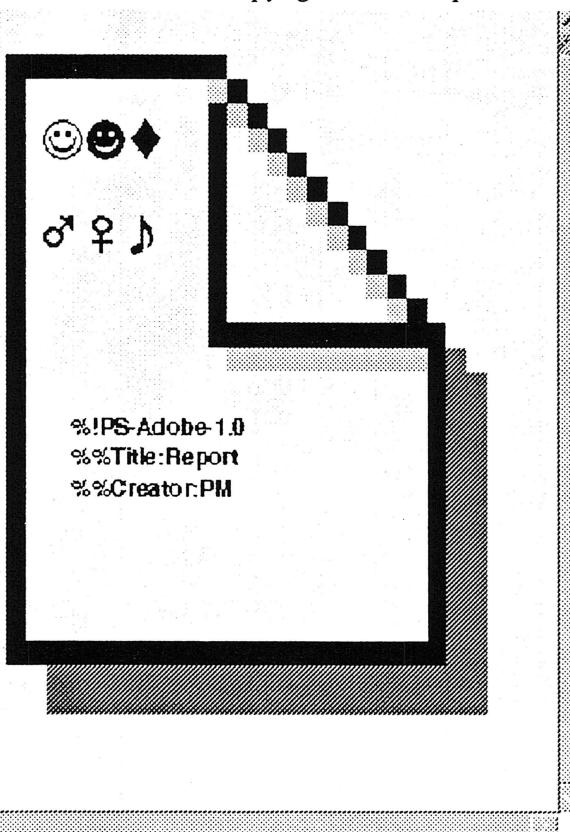


Figure 8-13. Job Prints Incorrectly

#### Description

- The first characters of a printout are incorrect.
- Printout consists of a few odd symbols at the top of each page.
- Printout did not format correctly.

#### Cause

- Incorrect Printer Driver for the attached printer.
- The printer-driver setup needs adjustment.

#### Solution or Recommended Action

- Ensure that the correct printer driver is being used.
- Make sure the printer being used emulates the selected driver 100%. Some printers do not fully implement emulation.
- Check and, if necessary, adjust the driver's printer properties to match the way in which your printer or plotter is physically set up.
- Check and, if necessary, set up the appropriate job properties.

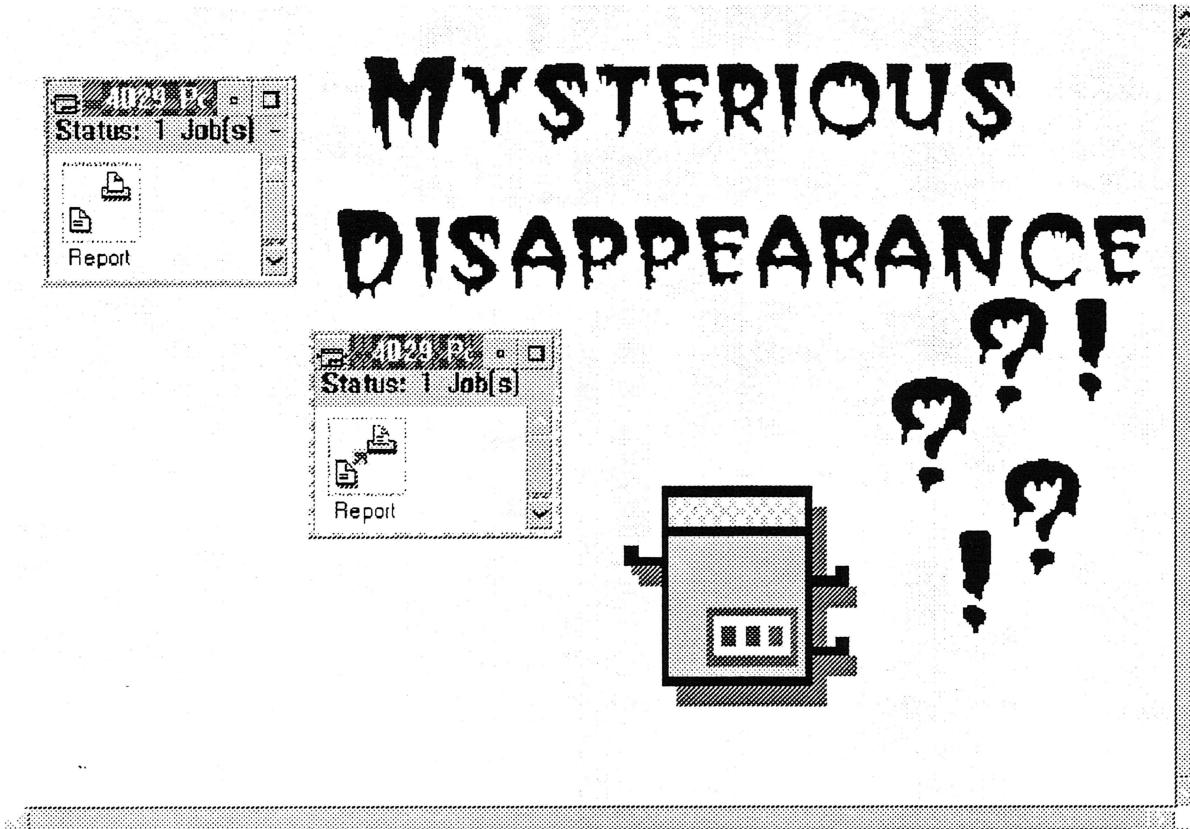


Figure 8-14. Job is Spooled, Queued, then Disappears

*Description*

- Job does not print. Print Job Object is seen spooling, queued, and then sent to printer.

*Cause*

- For the selected port, no physical port exists or no printer is attached.

*Solution or Recommended Action*

- Correct Port selection.

# Native DOS

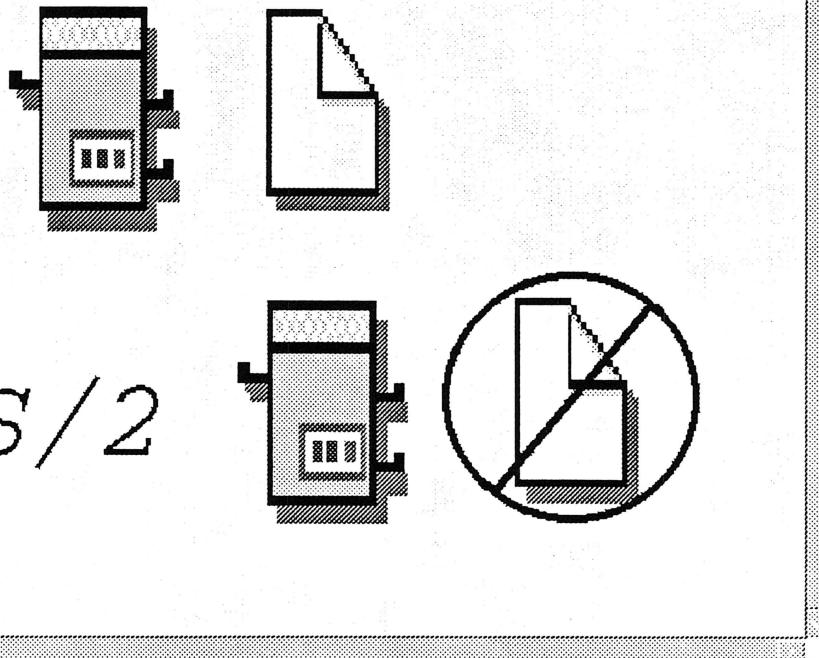


Figure 8-15. Printing works with DOS, but not with OS/2

#### Description

- Recently upgraded to OS/2. Cannot print when running OS/2. When running Native DOS, printing works as before.

#### Cause

- Hardware problem.

#### Solution or Recommended Action

- Check the Interrupt Request (IRQ) levels.

Your printer adapter might have a hardware interrupt request (IRQ) level conflict with other adapters installed in your system or may not correctly generate hardware interrupts. DOS does not recognize IRQ conflicts but because the OS/2 operating system does recognize these conflicts, printing is not possible. Industry Standard Architecture (ISA) computers do not allow hardware-interrupt sharing; therefore, each adapter must be configured to a separate IRQ level to work properly.

- If your adapter does not generate hardware interrupts, you might need to change your adapter to be able to print.
- Change the printer cable.

# "Forms Mismatched" Message

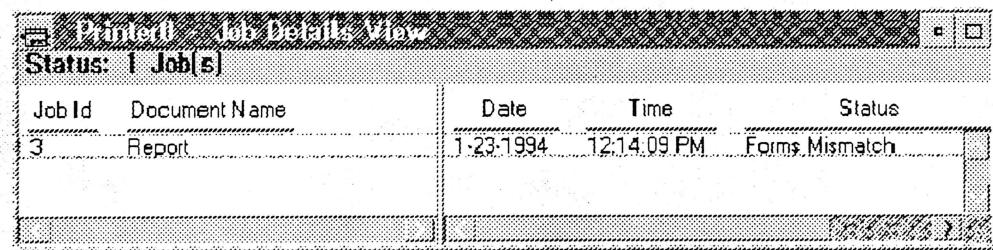


Figure 8-16. "Forms Mismatched" message

#### **Description**

- User received a "Forms Mismatched" error message.

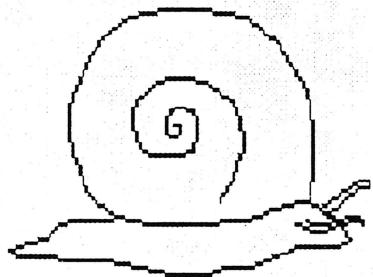
#### **Cause**

- The selected form for the print job is not connected to an input paper source.

#### **Solution or Recommended Action**

- During Print Job Dialog, select a connected form.
- Connect the desired form to the appropriate paper tray in the Printer Driver Settings.
- Ensure that Job Settings match Printer Settings.

# PRINTING SEEKS ...



... slow ...

Figure 8-17. Printing seems Slow

#### *Description*

- Printing seems slow.

#### *Cause*

- In a multitasking environment, the operating system balances print throughput with other active tasks.

#### *Solution or Recommended Action*

- Use device fonts.
- Increase Print Priority in Spooler Setting.
- Allow substitution of FAST SYSTEM FONTS, PRINTER PATTERNS and select PRINTER & SYSTEM fonts.
- Increase the PRINTMONBUFSIZE in the CONFIG.SYS.
- Disable Spooler (not recommended).

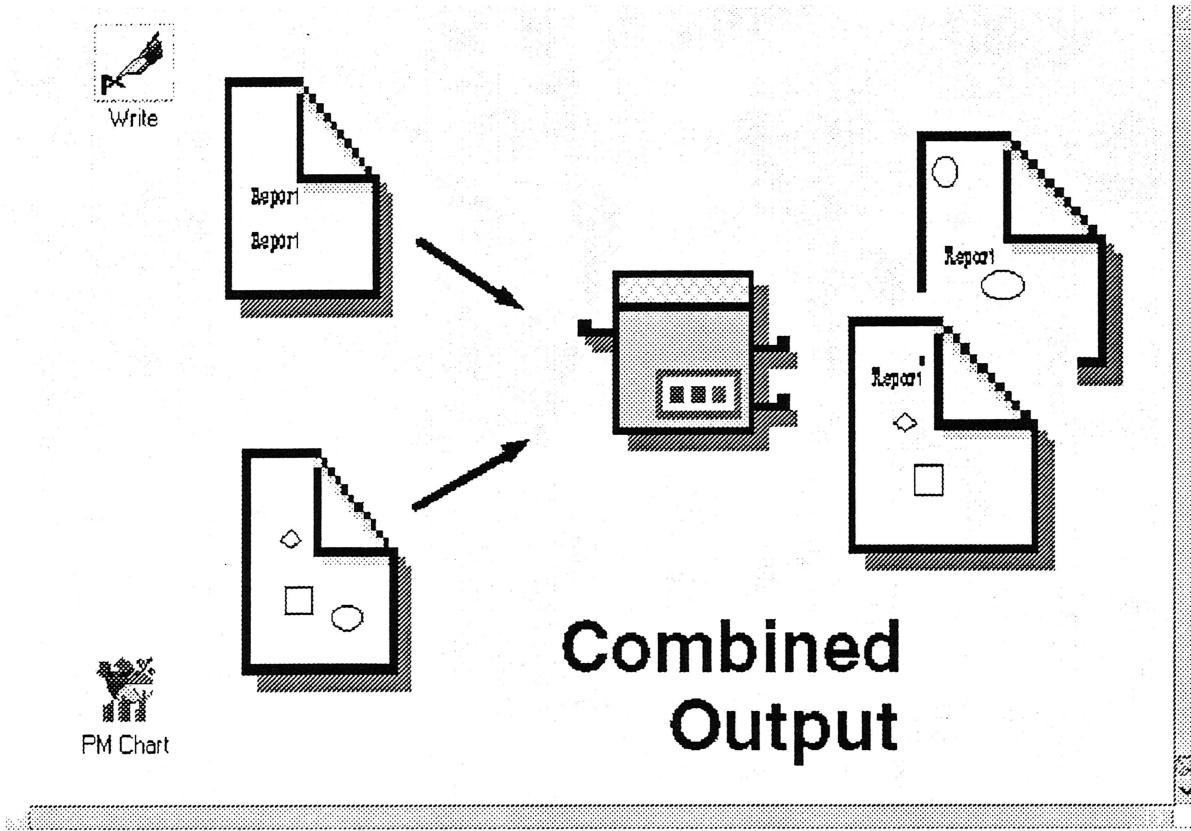


Figure 8-18. Output Combined for Print Jobs

**Description**

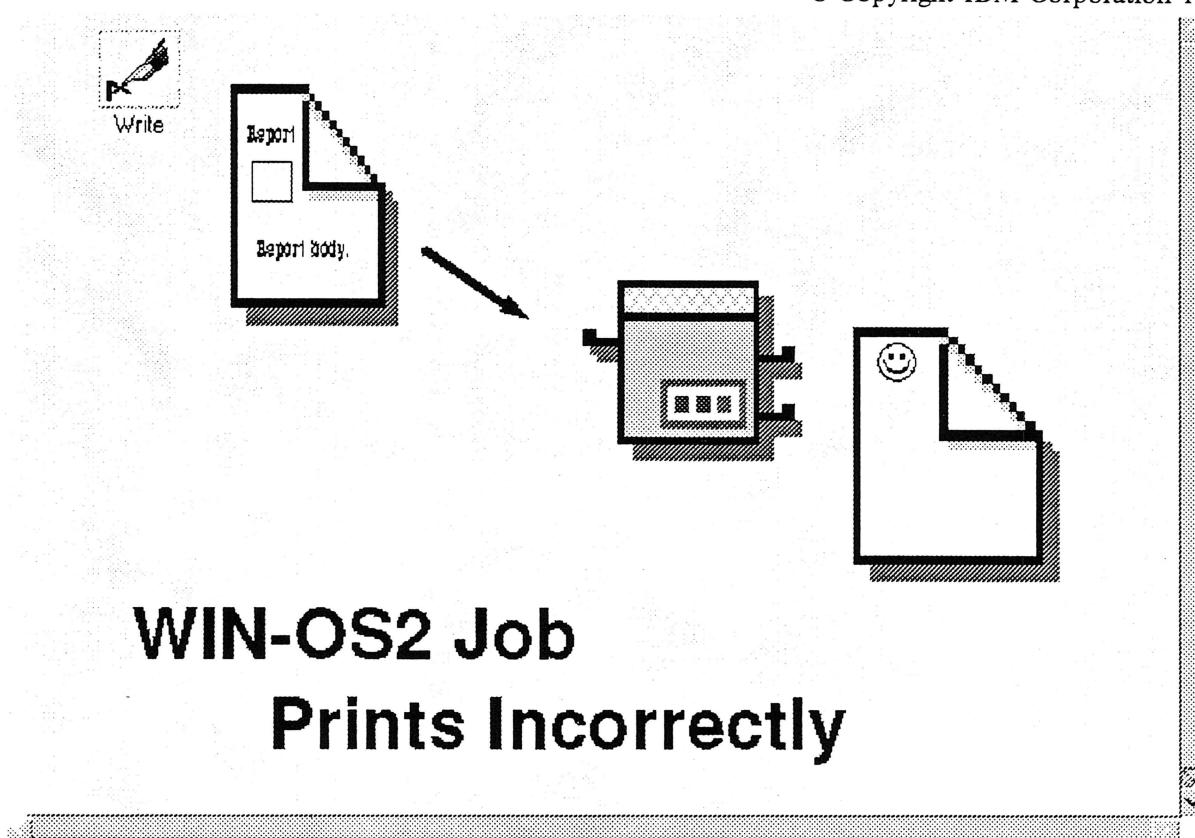
- The output from two separate print jobs was combined at the printer.

**Cause**

- Spooler disabled.

**Solution or Recommended Action**

- Enable Spooler, OR
- Wait for printing to complete before sending subsequent jobs.



## WIN-OS2 Job Prints Incorrectly

Figure 8-19. WIN-OS2 Job Prints Incorrectly

### Description

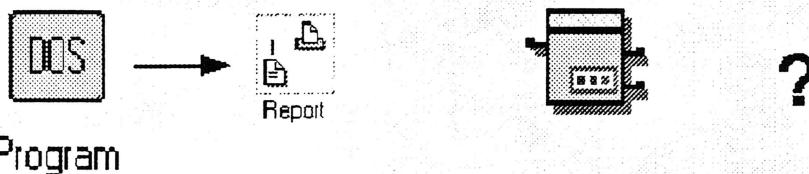
- WIN-OS2 job prints incorrectly. Strange characters and/or not properly formatted.

### Cause

- WIN-OS2 printer driver does not match the OS/2 printer driver.

### Solution or Recommended Action

- Install the correct "equivalent driver pairs" for the selected port. Refer to DRVMAP.INF and PRDESC.LST.



Program

## Printing Starts when DOS Program ends ...

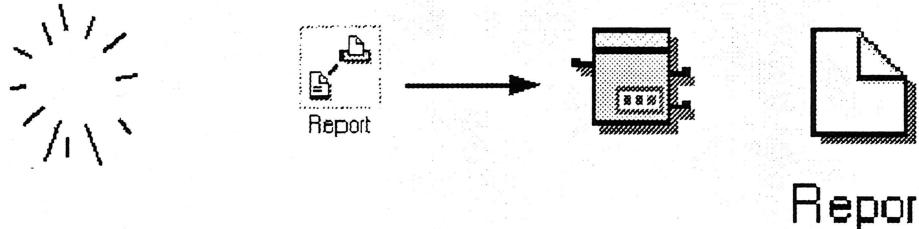


Figure 8-20. Printing Starts Only When DOS Application Ends

### Description

- A print job from a DOS application does not begin printing until the application is ended. It can continue to print from anywhere else. The job object status remains at "Job Spooling" until the DOS application is ended.

### Cause

- DOS application is not closing the job data stream.

### Solution or Recommended Action

- If your DOS print job does not begin printing until the application is ended, the application has not closed the data stream. Use the DOS\_DEVICE DOS setting to load the C:\OS2\MDOS\LPTDD.SYS device driver. Then, the PRINT\_TIMEOUT DOS setting can be used to close the print job without having to exit the application.

## Can Print ONLY from DOS Application ...

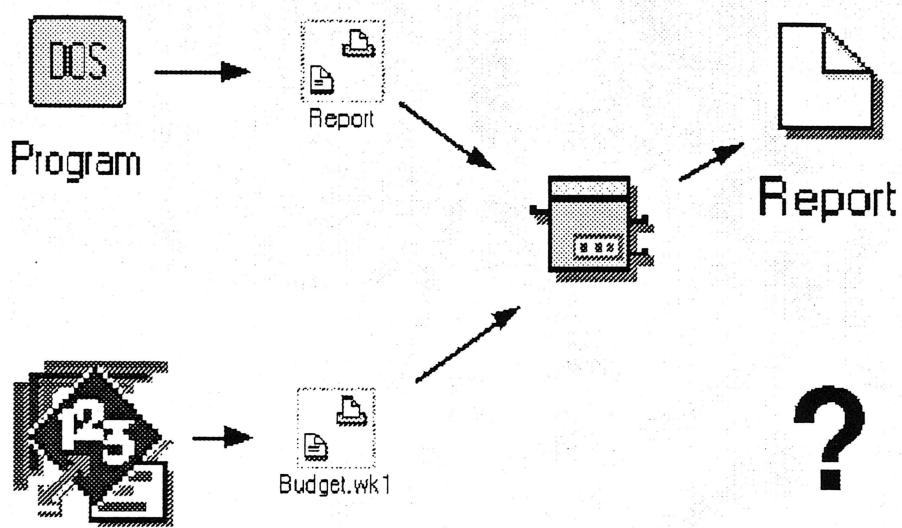


Figure 8-21. Can Print ONLY from DOS Application

### *Description*

- When a specific DOS Application is running, all other printing is held.

### *Cause*

- The DOS application is accessing the parallel-port hardware directly. OS/2 prevents two or more applications from simultaneously accessing the same parallel-port hardware. The second application must wait for the first application to end, even if the second application is the OS/2 print object.

### *Solution or Recommended Action*

- End the DOS application.

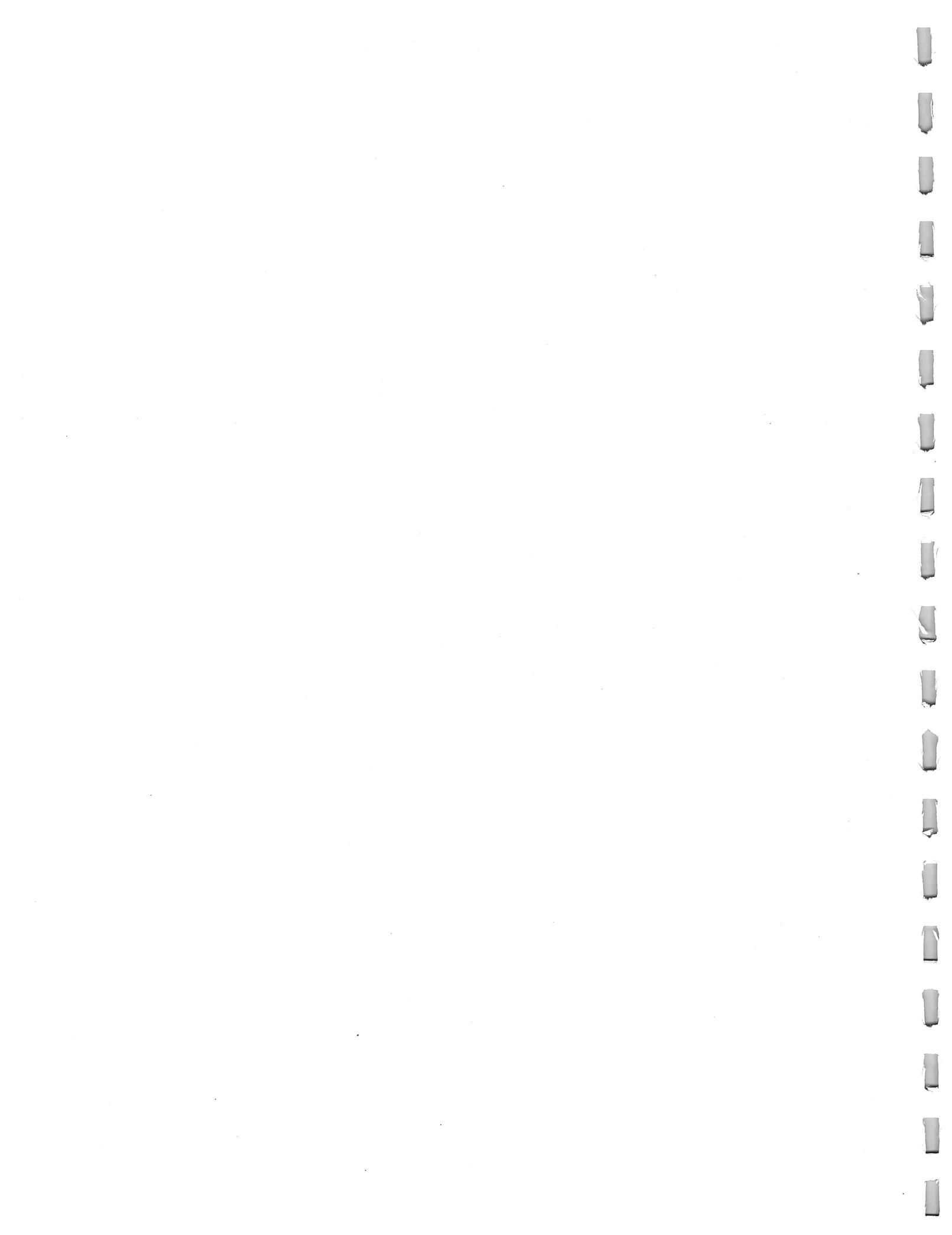
## **Topic Summary**

In this topic the student learned to understand the OS/2 Print Subsystem and resolve printing problems.

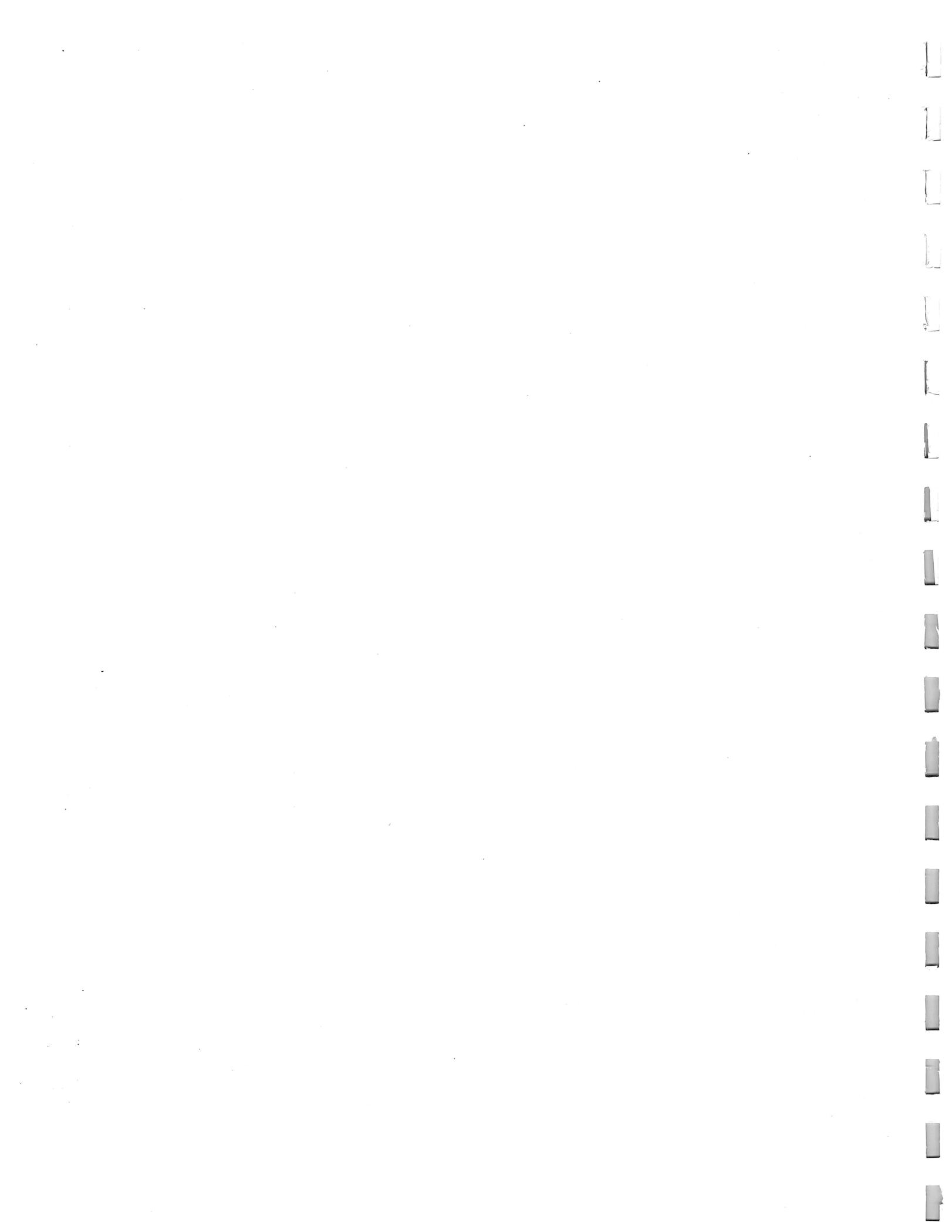
The student was taught:

- To identify the components of the Print Subsystem.
- To describe the Print Data Flow for different applications.
- How to identify and solve common printer problems.

This concludes the topic  
"OS/2 Printing"



**P1072 LABS:**



**LAB: "Bugs"**



## Bugs

### Background

Sometimes an End User accidentally does something that really can cause problems. A simple changing of a file name or even changing a path statement can have an application suddenly not function.

Generally, the solution is simple, the hard part is determining what the problem is.

### Objectives

- Run the program **BUG xx**.  
The **xx** represents the bug number you select. Select a number between 1 and 10 inclusive.
  - Follow the steps in the procedure
  - Determine the bug.
  - Fix the bug.
  - Write the steps required to fix the bug
- 

### Information

One bug is placed at a time. When you have determined the bug and fixed it, there is no need to continue following the steps in the procedure. Write the symptoms and your solution. Then, run the BUG program to have another bug placed on your machine.

There are ten bugs to resolve.

The following applications have been installed for you on the **F** drive.

Excel for OS/2  
Wordperfect for Windows  
Lotus 123 for DOS

## Procedure

Remember somewhere in these steps, you will find a 'bug'.

- 1) • Start your machine.  
Is everything fine?
- 2) • Start OS/2 2.1.  
Is everything fine?
- 3) • Start the "Excel" application.  
Is everything fine?
- 4) • Start the "WordPerfect" application.  
Is everything fine?
- 5) • Start the "Lotus 123" application.  
Is everything fine?
- 6) • From Excel, open a file such as ANNUAL.  
Is everything fine?
- 7) • Copy part of that file into the Clipboard.  
Is everything fine?
- 8) • Paste it into Wordperfect.  
Is everything fine?
- 9) • From Wordperfect, mark a section of the file and copy it into the Clipboard.  
Is everything fine?
- 10) • Change the font size of the DOS application to a larger font.  
Is everything fine?

If you have done all the steps in the procedure, and not found a bug, please let your instructor know.

## What happened?

Make note on what the bug was and how you resolved it. Also indicate the symptoms displayed by the bug.

Consider the following questions...

- What did you see OR not see that you were expecting?
- What did you think the bug was? What were your reasons?
- What steps did you perform to determine the cause of the bug?
- What did you do to fix the bug?
- Was your attempt successful?

**LABS: OS/2 INF file creation**



---

## Introduction to INF files Lab 1

### Compiling and using the required IPF tags for a document

#### Background

The OS/2 Programmers Toolkit is required to create on-line documents, as it contains the IPF compiler program. There are *many* functions and features that you may not know where to start. These labs will introduce you to some of the basics.

This set of labs is intended for those who have never created an IPF (Information Presentation Facility) document. It is really a "quick start" introduction to the basic features that are used most frequently in creating simple on-line documents. Not all of the functions are experimented with in these labs, only the basic ones. IPF is extremely powerful ... once you have mastered the basics you'll be able to go on to fully exploit the features of IPF.

A solution to this lab can be found in the **Labs** directory under the file name **P72LAB91.sol**. You may wish to alter that file as you experiment.

#### Objectives

- Experiment with tags that are required for all IPF documents:
    - USERDOC
    - TITLE
    - EUSERDOC
  - Compile your experiment to see if you have created an INF file
- 

#### Starting the IPF Reference on-line document

Open the Toolkit 2.1 folder

The TOOLKIT has been installed on the E partition.

## Starting the Getting Started with IPF on-line document

Start the **Getting Started with IPF** on-line document

It will be found in the LABS sub-directory. If you do not know where it has been installed, run the **Seek and Scan** program to determine the location of **IPFGUIDE.INF**.

You may have to create a program reference object for this document.

- Create another program reference object pointing to this manual
- Under the **Program** tab, fill in the following information;

- *Path and File name* D:\OS2\VIEW.EXE
- *Parameters* IPFGUIDE.INF
- *Working Directory* D:\LABS

In the **Session** tab, notice that the system will recognize that this is an OS/2 application.

- Under the **General** tab, name the application: Getting started with IPF

## Required tags for all documents

1. Start the Enhanced Editor and create a file called **lab1.ipf**.

**Note:** You can use the OS/2 System Editor instead, but you will find that resolving compiler errors will be easier using the Enhanced Editor. The Enhanced Editor can indicate line numbers.

2. Using your student notes, refer to the ones that mentioned the Required Tags.

3. Apply that information to your file **lab1.ipf**.

- Give the title **Lab #1. Required IPF Tags for all documents**
- Create a level one heading and name it **About This Document**
- Place the USERDOC and the EUSERDOC at their appropriate locations in your file.

If you are having some difficulties with where and how to start, refer to the **Getting started with IPF** online book.

Remember that the file **P72LAB91.sol** provides a solution to this lab. This is only a suggestion and a place to "start" should you require it..

## Compiling your IPF file

1. Save your file as *lab1.ipf*.
2. From a command prompt type
  - ***IPFC lab1 /INF***

Do not place any spaces between the */* (forward slash) and the ***INF***
3. Resolve any errors until the compiler indicates ***Output file successfully created***

## Running your INF file

1. Open an OS/2 command prompt.
2. From a command prompt type
  - ***VIEW lab1***

Notice what your current INF file offers. In the following labs, you will be enhancing this INF file.



## Introduction to INF files Lab 2

### Headings, Highlighting and, Font IPF tags in an on-line document

#### Background

- **Headings**

Perhaps the most versatile tag is the HEADING tag. Heading tags enable information to be displayed in windows. With IPF, you can specify six levels of headings, one through six.

Every heading tag that starts a window must have an associated text string. The text string becomes the window title and appears in the title bar of the window. The window title also becomes an entry in the Contents window, which lists the headings of all topics in an on-line document.

- **Highlighting**

Text can be highlighted by using different type styles or color. There are nine highlighted-phrase tags you can use to emphasize text (one through nine). Each tag requires a corresponding end tag (one through nine).

You can nest one highlight within another.

The type styles displayed for highlighted phrases correspond to the typeface currently being used by IPF. You can change the typeface to Courier, Helvetica\*\*, or Times New Roman\*\* by using the FONT tag.

- **FONTS**

A FONT tag is used to change the current font within the text of the current window. When a heading tag that defines a new window is encountered, the font is reset to the system default font.

The font tag has three attributes: **facename=**, **size=** and, **codepage=**. If a code page value is not specified, the code page of the active system is used.

A solution to this lab can be found in the **Labs** directory under the file name **P72LAB92.sol**. You may wish to alter that file as you experiment.

#### Objectives

- Using the source code and the results of the previous lab, experiment with the following IPF tags:
    - HEADINGS
    - HIGHLIGHTING
    - FONTS
  - Use the compiler to check your results.
-

## Getting ready for this lab

1. Copy your LAB1.IPF file to another file, and name it **LAB2.IPF**.
2. Start the Enhanced Editor with the LAB2.IPF file.
3. Change the title of the document to **Lab #2 Headings, Highlighting and Font IPF tags**

## The Headings tag

1. Using your student notes, refer to the ones that mention the Headings Tags.
2. Apply that information to your file **lab2.ipf** to make the following changes:
  - Create a level two heading and name it **Headings**
  - Create another level two heading and name it **Highlighting**
  - Create another level two heading and name it **FONTs**
3. Within each of these additional headings, type a brief description of their purpose.

Can't think of anything? You could use the brief description given in the Background section of this lab.

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## The Highlighting tag

1. Using your student notes, refer to the ones that mention the Highlighting Tags.
2. Apply that information to your file **lab2.ipf** to make the following changes:
  - Alter the line that indicates **your name** such that it is highlighted in **red**.  
If this is not currently in your file, type it in.
  - Alter the line that indicates **your company name** such that it is highlighted in **Italics**.  
If this is not currently in your file, type it in.
  - Alter the line that indicates **AN IPF DOCUMENT** such that it is highlighted in **Bold Italic**.  
If this is not currently in your file, type it in.
3. In your LAB2.IPF file, move to the section referred to as **Required tags**
4. Notice the area **Only 3 tags are required for every document**: change all the IPF tags **userdoc**, **title and**, **euserdoc** such that they are highlighted in light blue.

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## The Font tag

1. Using your student notes, refer to the ones that mentioned the Font Tags.
2. Under this heading, type a brief description of the purpose of the Font tag.
3. After that paragraph, use the font tag to indicate a font change to **Courier** and **size=13x8**
4. After that Font tag, create a new paragraph (:p.) and type in
  - This is a Courier font size 13 by 8.
5. After that paragraph, use the font tag to indicate a font change to **Helv** and **size=28x18**
6. After that Font tag, create a new paragraph (:p.) and type in
  - This is a Helvetica font size 28 by 18.

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## Compiling your IPF file

1. Save your file as **lab2.ipf**.
2. From a command prompt type
  - **IPFC lab2 /INF > IPF.LOG**

Refer to the Warning Levels 1, 2 and 3 messages in the IPF Reference book for an explanation of the error codes.
3. Resolve any errors until the compiler indicates **Output file successfully created**.

## Running your INF file

1. Open an OS/2 command prompt.
2. From a command prompt type
  - **VIEW lab2**

Notice what your current INF file offers. In the following labs, you continue enhancing this file.



## Introduction to INF files Lab 3

### Lists, Tables and, Artwork IPF tags in a document

#### Background

- **Lists**

Simple lists are vertical arrangements of items without any symbol or character preceding the items in the list. Use simple lists when the order of the items are not important.

Use the **compact** attribute to produce a list with no blank lines between the list items. This is known as a Compact simple list.

Unordered lists are vertical arrangements of items, with each item in the list preceded by a special character, usually the lowercase "o" (called a bullet). Use unordered lists when the order of the items is not important.

Ordered lists are vertical arrangements of items, with each item in the list preceded by a number or letter. Use ordered lists when the sequence of the items is important, such as in a procedure.

- **Tables**

Table tags enable you to display text in an arrangement of rows and columns. The system font used to create tables is the monospace font.

If you have more tags following a tag than you have column-width values, the extra column entries are placed in a new row, and the compiler returns an error message.

If you have fewer tags than column-width values, the compiler does not consider this an error. Space is still allocated for the specified columns; however, only the columns for which you have provided entries will be filled.

- **Artwork**

With the artwork tag you can illustrate your text with bit-map or metafile graphics. A bitmap is a representation of an image, and can be created with such tools as the Icon Editor, which is available with the Toolkit. Metafiles provide device independence - bitmaps do not. The bitmap or metafile graphics reside in a file that must be specified with the name= '' attribute of artwork. This file is then loaded when you compile your source file with the IPF compiler.

A solution to this lab can be found in the **Labs** directory under the file name **P72LAB93.sol**. You may wish to alter that file as you experiment.

## Objectives

- Using the source code and the results of the previous lab, experiment with the following IPF tags:
    - LISTS
    - TABLES
    - ARTWORK
  - Use the compiler to check your results.
- 

## Getting ready for this lab

1. Copy your LAB2.IPF file to another file, and name it ***LAB3.IPF***.
2. Start the Enhanced Editor with the LAB3.IPF file.
3. Change the title of the document to ***Lab #3 Lists,Tables and Artwork IPF tags***

## Adding more Headings

1. Using your student notes, refer to the ones that mention the Headings Tags.
2. Apply that information to your file ***lab3.ipf*** to make the following changes:
  - Create a level two heading and call it ***Lists and Tables***
  - Create a level three heading and name it ***Lists***
  - Create another level three heading and name it ***Tables***
  - Create a level two heading and name it ***Artwork***
3. Within each of these additional headings, type a brief description of their purpose.

Can't think of anything? You could use the brief description given in the Background section of this lab.

If you are having some difficulties, refer to the ***Getting started with IPF*** on-line document.

## The Lists tag

1. Using your student notes, refer to the ones that mention the List Tags.
2. Apply that information to your file **lab3.ipf** to make the following changes:

- Create an **Unordered list** containing three items:
  - Item One
  - Item Two
  - Item Three
- Create an **Ordered list** containing four items:
  - a. Apples
  - b. Peaches
  - c. Pears
  - d. Plums
- Create an **Simple list** containing five items:

Rocker  
Cushion  
Chair  
Sofa  
Bench

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## The Tables tag

1. Using your student notes, refer to the ones that mention the Table Tag.
2. Under this heading, type a brief description of the purpose of the Table tag.
3. Create a table that has four rows (R1 to R4) and two columns (C1 to C2)
  - **R1,C1** highlight words **Days of the week**
  - **R1,C2** highlight words **Activities**
  - **R2,C1** the words - Monday through Friday
  - **R2,C2** the words - Go to the office
  - **R3,C1** the words - Saturday
  - **R3,C2** the words - Cleaning and Shopping
  - **R4,C1** the words - Sunday
  - **R4,C2** the words - Rest and Play

## Artwork tag

1. Using your student notes, refer to the ones that mention the Artwork Tag.
2. Under this heading, type a brief description of the purpose of this tag.
3. Place two bitmaps within your IPF file:
  - Place the bitmap **Columns.bmp** at the start of the file, just before the date.  
This bitmap will be found in the LABS directory.
  - Place another bitmap **Flamingo.bmp** after the level two heading of Artwork.

## Compiling your IPF file

1. Save your file as **lab3.ipf**.
2. From a command prompt type
  - **IPFC lab3 /INF > IPF.LOG**  
Refer to the Warning Levels 1, 2 and 3 messages in the IPF Reference book for an explanation of the error codes.
3. Resolve any errors until the compiler indicates **Output file successfully created**.

## Running your INF file

1. Open an OS/2 command prompt.
2. From a command prompt type
  - **VIEW lab3**  
Notice what your current INF file offers. In the following labs, you continue enhancing this file.

---

## Introduction to INF files Lab 4

### Indexing and "Hypertext like" IPF tags

#### Background

- **Indexing**

IPF provides an index for on-line documents.

Index entries are imbedded in the text of a window. You should create at least one index entry for each window, using this tag. The text of an index entry must be on the same line as the tag.

- **"Hypertext like"**

"Hypertext" is the linking of on-line information so the user can navigate from selectable text to related information. A "hypertext" link is the association between two topics. The origin of the link is the source topic; the destination is the target topic.

A solution to this lab can be found in the **Labs** directory under the file name **P72LAB94.sol**. You may wish to alter that file as you experiment.

#### Objectives

- Using the source code and the results of the previous lab, experiment with the following IPF tags:
    - INDEXING
    - "HYPERTEXT LIKE"
  - Use the compiler to check your results.
- 

#### Getting ready for this lab

1. Copy your LAB3.IPF file to another file, and name it **LAB4.IPF**.
2. Start the Enhanced Editor with the LAB4.IPF file.
3. Change the title of the document to **Lab #4 Indexing and "Hypertext like" IPF tags**

## Adding more Headings

1. Using your student notes, refer to the ones that mention the Headings Tags.

2. Apply that information to your file **lab4.ipf** to make the following changes:

- Create a level one heading and call it **Getting Fancier**
- Create a level two heading and name it **Indexing**
- Create another level two heading and name it "**Hypertext like**"

3. Within each of these additional headings, type a brief description of their purpose.

Can't think of anything? You could use the brief description given in the Background section of this lab.

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## The Index tag

• Using your student notes, refer to the ones that mention the Index Tag.

• Apply that information to your file **lab4.ipf** to make the following changes:

- For the section on **Required Tags**, create an index can call it **Required Tags**
- For the section on **Headings**, create an index can call it **Headings**
- Repeat this for all sections you have created from the IPF labs.

If you are having some difficulties, refer to the **Getting started with IPF** on-line document.

## The "Hypertext like" tag

1. Using your student notes, refer to the ones that mention the "Hypertext Like" Tag.

2. Under this heading, type a brief description of the purpose of this tag.

3. Create a link for the topic **FONTS**.

- Use **h2 res=014. Fonts**

4. Somewhere in the **Indexing** section place a link to the FONTS section:

- **This is an example of a "hypertext like" link with the :link reftype=hd res=014. Fonts :elink. topic.**

## Compiling your IPF file

1. Save your file as *lab4.ipf*.
2. From a command prompt type
  - **IPFC lab4 /INF > IPF.LOG**Refer to the Warning Levels 1, 2 and 3 messages in the IPF Reference book for an explanation of the error codes.
3. Resolve any errors until the compiler indicates ***Output file successfully created***

## Running your INF file

1. Open an OS/2 command prompt.
2. From a command prompt type
  - **VIEW lab4**



**LABS: Introduction to REXX**



---

## Introduction to REXX Lab 1

### Getting Started in REXX

#### Background

This exercise focuses on familiarizing the participant with the REXX development environment. The *OS/2 Procedures Language 2/REXX User's Guide* is introduced as a good source of information. In addition, two basic REXX instructions are utilized in a simple REXX procedure.

#### Objectives

- Use the OS/2 Procedures Language 2/REXX On-line User's Guide
  - Use the SAY instruction
  - Use the PULL instruction
  - Run a simple REXX procedure
- 

#### Getting to the on-line REXX Documentation

- Open the **Information** folder situated on the Desktop
- Start the **PS/2 Procedures Language 2/REXX**
- Single click on **Getting started in REXX**
- Double click on **Writing a REXX Procedure**

#### Writing a simple REXX Procedure

Follow the instruction in steps 1, 2, and, 3 as indicated in the **Writing a REXX Procedure**

## Expected Results

You should be able to run **Hello.cmd** from an OS/2 Window or Full Screen command prompt.

The results should display as shown:

```
[D:\]hello  
Hello! What is your name?  
Barbara  
Hello BARBARA  
[D:\]
```

## Introduction to REXX Lab 2

### Variables and Expressions

#### Background

REXX regards all data as character strings. This means that there is no need to predefine variables or variables arrays as strings or as numbers. REXX performs arithmetic operations on any string that represents a valid number, including those in exponential formats.

This exercise will utilize variables for storing information and expressions to manipulate that data.

#### Objectives

- Use mathematical operators and expressions
  - Create a program that asks for two numbers, adds them together, and displays them on the screen.
- 

#### Writing the REXX Procedure

1. Use your editor to create a file called ADD2NUM.CMD
2. Place a comment at the very top of the program.
3. Write a REXX instruction that will cause the program to place a line on the screen that says:  
Type a number:

**Hint:** Remember to use the **say** instruction and place the text in parentheses.

4. Use the **pull** instruction to place the value entered by the user in a variable called **first**.
5. Write a REXX instruction that will cause the program to place another line on the screen that says:  
Type another number:
6. Cause the second value entered by the user to be placed in a variable called **second**.
7. Write a REXX instruction that will cause the two values to be added and displayed on the screen as follows:

The sum is: x

Where x is the sum of **first** and **second**.

**Hint:** Remember to use the **say** instruction, place the text in parentheses, followed by the expression (outside of parentheses) that adds **first** and **second** together.

## Expected Results

You should be able to run ADD2NUM.CMD from an OS/2 Window or Fullscreen command prompt. It should display on the screen as follows:

```
[D:\]add2num
Type a number:
?
25
Type another number:
?
32
The sum of 25 and 32 is equal to 57
[D:\]
```

## Having some difficulties?

Here is a listing of what your program might look like.

```
/*      a program to add two numbers together          */
SAY "Type in a number"    /* The SAY instruction places everything */
                           /* within quotes to the screen           */
PULL first                /* The PULL instruction takes what has */
                           /* been entered on the keyboard and     */
                           /* places it in a variable called first */
                           /*                                         */
SAY "Type another number"

PULL second

SUM = first + second

SAY "The sum of"   first " and " second "is equal to" sum
```

---

## Introduction to REXX Lab 3

### Program Flow Control

### Background

This exercise will use a conditional operation to control the flow of a program.

### Objectives

- Control the flow of a program with conditional operators IF, THEN, ELSE.
  - Create a program that asks for the condition of the sun, and responds according to the user's input.
- 

### Steps

1. Use your editor to create a file called WAKUPCAL.CMD
2. Write a REXX instruction that will cause the program to place a line on the screen that says:  
Type SHINING or OBSCURED to describe the condition of the sun:
3. Use the **pull** instruction to place the value entered by the user in a variable called **sun**
4. Write a REXX instruction using **if** that will evaluate the variable **sun** to see if it contains the string **shining**

**Hint:** The form should be (IF variable = value).

5. On the next line type **then**.
6. Write a **DO** routine, using two separate **say** instructions that will display the following on the screen if **shining** is the value of the variable **sun**.

get up  
get out

**Hint:**

```
DO
    statement...
    statement...
END
```

7. On the next line type **else**.
8. Write a **DO** routine, using two separate **say** instructions that will display the following on the screen if **shining** is not the value of **sun**.

stay down  
stay in

***Hint:***

```
DO  
    statement...  
    statement...  
END
```

## **Expected Results**

You should be able to run WAKUPCAL.CMD from an OS/2 Window or Full Screen command prompt. It should display on the screen as follows, depending on your response:

```
[D:\]wakupcal  
Enter OBSCURED or SHINING to describe the sun's condition:  
shining  
get up  
get out
```

```
[D:\]wakupcal  
Enter OBSCURED or SHINING to describe the sun's condition:  
obscured  
stay down  
stay in
```

```
[D:\]
```

## Introduction to REXX Lab 4

### Writing to a File

### Background

In this exercise you will alter the WAKUPCAL.CMD program you created in exercise three to write to a file on disk instead of the screen.

### Objectives

- Use the LINEOUT() function to create and write to a file.

Software required to do this exercise:

- OS/2 Version 2.1
  - OS/2 Procedures Language 2/REXX
  - EPM Enhanced OS/2 Editor
  - WAKUPCAL.CMD
- 

### Steps

1. Use your editor to open WAKUPCAL.CMD
2. Find the **SAY** statements that are executed when the user responds with *shining*.
3. Change them to send their output to disk as follows:

```
say lineout(shining.txt, "get up")
say lineout(shining.txt, "get out")
```

4. Find the **SAY** statements that are executed when the user responds with *obscured*.
5. Change them to send their output to disk as follows:

```
say lineout(obsured.txt, "get up")
say lineout(obsured.txt, "get out")
```

## Expected Results

You should be able to run WAKUPCAL.CMD from an OS/2 Window or Full Screen command prompt. It should create a file with instructions on the disk depending on the user's response. If the user responds "*shining*," a file named SHINING.TXT will be created. If the user responds "*obscured*," a file named OBSCURED.TXT will be created.

**LABS: Introduction to Advanced REXX**



---

## **Introduction to Advanced OS/2 REXX Lab 1**

### **Display Currently Available Workplace Shell Classes**

#### **Background**

The following two exercises provide a practical demonstration of RexxUtil function procedures and the ease with which they can be created. After completion of the exercises, the participant will have written programs using REXX functions that list Classnames as well as create and manipulate objects on the Desktop. Further, the participant will know where to look for further information regarding REXX functions for their programming needs.

The exercises will guide the participant through:

- View a REXX program to list Class names on your system
- Use REXX information to check the syntax of a program
- View and update a REXX program to add objects to a Desktop
- Make Changes to a REXX program using functions
- Testing the program

This exercise will allow you to look at a REXX program, QCLASS.CMD to further understand the use of the RexxUtil function.

#### **Objectives**

- Use the Enhanced Editor to view a REXX program.
  - Use REXX information to check that the program is correct.
  - Run the program to see that it performs as expected.
- 

#### **Steps**

1. Use your editor to view a file called QCLASS.CMD
2. Check that the program is using RexxUtil correctly:
  - Open the information folder from the Desktop.
  - Open REXX Information.
  - Double click on REXX Utility Functions (RexxUtil).
3. Make sure that the SysQueryClassList function is correct.
  - Open the information folder from the Desktop.

- Open REXX Information.
  - Click on the plus sign next to REXX Utility Functions (RexxUtil).
  - Search the list for SysQueryClassList and double click on it.
4. What kind of loop is being used? \_\_\_\_\_
5. After you have reviewed the file, save and close the file.

## **Expected Results**

You should be able to run QCLASS.CMD from an OS/2 Window or Full screen command prompt. It should display the list of currently available Workplace Shell Object Classes.

**NOTE:** In the next lab you will be using 4 of these object classes.

---

## Introduction to Advanced REXX Lab 2

### Creating Objects on the Desktop

#### Background

In this exercise you will alter the file ADSTUFF.CMD to add a folder and, add a program reference object, and shadow into that folder.

#### Objectives

- Edit a program and use REXX functions to create a folder on the desktop.
  - Change the names of the folder and program reference object.
  - Use REXX information to change the title.
  - Use REXX information to assure the program is correct.
  - Run the program and check the results.
- 

#### Steps

1. Use your editor to open ADSTUFF.CMD
2. Find the SysCreateObject lines.
3. Modify these statements to change the name of a folder that will be placed on the desktop and a Program Reference object that will be placed in that folder.
4. Use REXX information to find out which parameter is the title.
  - Open the information folder on the Desktop
  - Open REXX information
  - Click on the plus sign next REXX Utilities
  - Select SysCreateObject and locate the Title parameter

The following is an example of some changes:

```
Call SysCreateObject "WPFolder",
"My"]]"0a"x]]"Very"]]"0a"x]]"Personal"]]"0a"x]]"Folder",      "<WP_DESKTOP>",  "OBJEC
TID=<AFOLDER>;", "U"
If result >>1 then say "Unable to create the folder <My Very Personal Folder> i
n <Desktop>."
```

```
Call SysCreateObject "WPProgram", "My]]"0a"x]]"Super"]]"0a"x]]"Duper"]]"0a"x]]"
Editor",      "<AFOLDER>","OBJECTID=<MYED>;EXENAME=D:\OS2\APPS\EPM.EXE;","U"
If result >>1 then say "Unable to create the program <My Super Duper Editor> in
<My Very Personal Folder>."
```

```
Call SysCreateObject "WPShadow", "Calculator", "<AFOLDER>",  "SHADOWID=<WP_DCALC
>;", "U"
If result >>1 then say "Unable to create the shadow <Calculator> in <My Very Pe
rsonal Folder>."
```

```
Call SysCreateObject "WPDataFile", "Memo from Michael", "<AFOLDER>", "U"
If result >>1 then say "Unable to create the data file <Memo from Michael> in <
My Very Personal Folder>."
```

- The "]]"0a"x]]" group of characters is used to add a carriage return into the title.
- Add to the program, the names you desire, under title.
- Be aware, if you change the name of the folder, to also change the path for the data file that is being created at the end of the program.

## Expected Results

You should be able to run ADSTUFF.CMD from an OS/2 Window or Full screen command prompt. It should create a folder on your OS/2 Desktop with the name that was included in the program. Within this folder there should be a program reference object as well as a shadow and data object as specified in the program.

Test your results by opening the new folder and dragging the data object to the editor.

**LAB: OS/2 Video Support**



---

## **OS/2 Video Lab**

### **Background**

Video problems account for a significant number of calls to the OS/2 Help Line. In this exercise you will apply your skill in using online tools and your knowledge about OS/2 video support to solve typical problems.

### **Objectives**

When you complete this exercise you will be able to:

- Use keywords to search for information on video problems.
  - Using online directions, code a REXX program to enlarge the cursor. (Useful on laptops with LCD screens.)
  - Diagnose and repair a video problem on your system.
  - Describe and use APAR information.
- 

### **References**

- PS/2 Assistant
  - Chapter 27, Using the Operating System
  - README file
  - OS2APAR6.INF
-

## **Scenario #1**

John called saying that he is running an ATI Ultra card in 8514 mode and is getting the Adobe "A" in the lower left of his desktop. What should he do?

**NOTE:** Your success in this will depend on having set the BOOKSHELF parameter correctly to search all INF files in the lab subdirectory and your skill in selecting the right keyword(s) when searching all libraries.)

I called John and recommended he do the following:

*Refresh desktop.*

**Scenario #2**

Nancy called complaining about not being able to see the mouse pointer on her laptop. How can it be made larger?

When you find a solution test it on your own system.

### **Scenario #3**

Joanne called saying she was getting an error message after she installed SVGA support. Her system will not boot up.

Run **BADVIDEO** from a command line and reboot your system.

Did you get an error?

What was the error message?

What tools do you need to fix it?

What did you do to fix the problem?

**LABS: OS/2 Maintenance and Recovery**



# OS/2 Maintenance and Recovery Lab 1

## Creation of a Maintenance partition

### Background

You can always use a two-diskette boot to start a system. However, it may make more sense to use one diskette or to create a small maintenance partition from which to run OS/2, for problem resolution, adding maintenance updates, or other requirements. In this unit you will create a small bootable OS/2 system.

### Objectives

At the end of this exercise you should be able to:

- Use BOOTOS2 to create a minimum maintenance partition on the hard drive.
  - Use the maintenance drive to correct file system corruption.
- 

### Reference

- NOTE: BOOT2X is the name of the zip file on the bulletin board (BOOT2X.ZIP).
- The program name is BOOTOS2.
- Provided with the program, is documentation on how to use the program (BOOTOS2.DOC).

BOOT2X will be found in \LABS\BOOT2X

### Creating a maintenance drive

Create a maintenance drive on the G: drive of your system using BOOTOS2. Refer to the documentation for using this program.

**Note:** Please do not disturb any other drives, as they may contain data.

The files associated with the BOOT2X.ZIP have been unzipped and have been placed in the subdirectory

- \abs\boot2x
  1. Use an editor to look at the file BOOTOS2.DOC. You will be using the Target and Type parameters.
  2. Determine if you have enough space to install a WPS type on the drive.
  3. Run the program with the Target and Type parameters. Note that if you plan to run REXX batch files, you should include the REXX parameter. *BOOTOS2 TARGET = G; TYPE=WPS REXX*

The SWAP parameter is used to move the SWAPPER.DAT to a different drive. Care should be taken when relocating SWAPPER.DAT; remember, CHKDSK /F cannot be run on an active drive.

4. Configure your system to boot the maintenance drive.
5. Boot the new maintenance drive and verify that it operates correctly.
6. Run CHKDSK from the maintenance drive to correct file system corruption.
  - Shutdown and boot OS/2 from the C: drive
  - Turn the power off. This will set the 'dirty bit' for all open files.
  - Boot the MAINTAIN drive.
  - Run CHKDSK /f on the C: drive. Observe the repair process.

## OS/2 Maintenance and Recovery Lab 2

### Creating a Single Boot Diskette

#### Background

You can use the Installation diskette and diskette 1 to boot a machine, but wouldn't it be easier to have just one diskette? In this exercise, you will create a single-disk boot.

#### Objectives

At the end of this exercise you should be able to:

- Use KRE8BOOT.CMD to create a one diskette boot.

KRE8BOOT 2 A: d:

---

#### Exercise Instructions

Create a single diskette from which to boot your system, using KRE8BOOT.CMD. The program that has been provided in the \LABS subdirectory, is written using REXX, and therefore can be viewed.

1. Use an editor to look at the file KRE8BOOT.CMD. You will be using the Source and Target parameters.
2. Note the lists that are built and used to transfer files to the new disk.
3. The program will require the use of the Installation and Diskette 1 for certain files and the remainder of the files will be provided by the location of OS/2 on the hard drive.
4. Run the program with the Source and Target parameters following instructions as to when to change disks.
5. Check the contents of the diskette and observe the amount of space remaining after the minimum number of files to boot OS/2 have been transferred.
6. Boot the new diskette and verify that it operates correctly.
7. Run CHKDSK from the maintenance drive to correct file system corruption.
  - Shutdown and boot OS/2 from the C: drive
  - Turn the power off. This will set the 'dirty bit' for all open files.
  - Boot using the New Diskette, then go to your OS/2 partition on the hard drive.
  - Run CHKDSK /f on the drive. Are there any problems?



## OS/2 Maintenance and Recovery Lab 3

### Create and Maintain a Historical Record of INI Files

#### Background

The OS2.INI and OS2SYS.INI files are the heart of the Workplace Shell and are essential for its operation. In OS/2 2.0, these files were not accessible while the system was running; but in OS/2 2.1, parts of the INI files are kept in memory and the images on the hard drive can be copied at any time.

#### Objectives

At the end of this exercise you should be able to:

- Create a backup directory for critical files.
- Use STARTUP.CMD to create a backup of INI files.

#### Steps

1. Make a directory RECOVER in the root, where OS/2 is installed
  - Open an OS/2 Window
  - Use the Make Directory command to create a backup directory.
    - **MD RECOVER**
2. Use the System Editor to create a file called STARTUP.CMD
  - Locate the System Editor in the Productivity Folder.
  - Open a file called STARTUP.CMD (a New File)
3. Add statements to this new file to create a history of the INI files.
  - You can use RENAME to create backups; this uses less system resource because no data is moved.
    - **REN D:\RECOVER\OS2\*.003 D:\RECOVER\OS2\*.004**
    - **REN D:\RECOVER\OS2\*.002D:\RECOVER\OS2\*.003**
    - **REN D:\RECOVER\OS2\*.001 D:\RECOVER\OS2\*.002**
    - **COPY D:\OS2\OS2\*.INI D:\RECOVER\OS2\*.001**

**Note:** This sequence of commands will fail the first three times it is executed: Statement 1 will fail 3 times, statement 2 will fail 2 times and statement 3 will fail 1 time.

Why may you need to have so many backups of INI files?



## **OS/2 Maintenance and Recovery Lab 4**

### **Re-createINI files using MAKEINI command**

#### **Background**

System settings, such as application defaults, display options, and file options, are contained in the OS2.INI startup file located in the C:\OS2 directory of your hard disk. There is also a system file called OS2SYS.INI, which contains information about installed fonts and printer drivers.

If you receive a message stating that the OS2.INI file is corrupted, the OS2.INI file installed on your system must be replaced by another valid copy of the OS2.INI file.

To accomplish this, use the MAKEINI program from your command prompt.

Added to your system during the installation process, the MAKEINI.EXE file creates a new OS2.INI file containing default information. You should re-create both the user and systemINI files using MAKEINI (located in the \OS2 directory of your hard disk).

**Note:** You can rename the OS2.INI and OS2SYS.INI files to names of your choice as long as the same file names are reflected in the PROTSHLL statement in the CONFIG.SYS file.

#### **Objectives**

At the end of this exercise you should be able to:

- Successfully use the MAKEINI utility to Re-createINI files.

#### **Steps**

1. Review the on-line Information on the MAKEINI Utility.
  - Open an OS/2 Window.
  - Key in 'help makeini'.
  - When finished close the window.
2. Re-boot the machine using a diskette boot or the maintenance drive.
3. Locate the OS2 directory in the D: drive.
4. Display all the \*.RC files. (DIR \*.RC)
5. Note: that there are RC files used to make the desktop look like OS/2 1.3 or Windows.
6. Use the MAKEINI utility to create newINI files.
  - MAKEINI OS2.INI INI.RC
  - MAKEINI OS2SYS.INI INISYS.RC



---

## **OS/2 Maintenance and Recovery Lab 5**

### **Use the magic keystrokes to restore INI files created at installation**

#### **Background**

When supporting others, it may become necessary to have a quick way to replace corrupted INI files. The ALT+F1 key combination can do just that, when there isn't backup INI files or the MAKEINI Utility to use.

#### **Objectives**

At the end of this exercise you should be able to:

- Successfully use the ALT+F1 key combination to restore a corrupted Desktop.

#### **Steps**

1. Shutdown your system.
2. At the CTRL-ALT-DEL message, re-boot your system.
3. When the three OS/2 logos appear on the screen press and hold the ALT+F1 keys.
4. Note: the message indicating the activity with the files.
5. If you are not successful with the procedure, try it once again.
6. It may be necessary to discover the correct timing for the key sequence.



---

# **OS/2 Maintenance and Recovery Lab 6**

## **Use an Editor to View INI Files**

### **Background**

In OS/2 2.0, these files were not accessible while the system was running; but in OS/2 2.1, parts of the INI files are kept in memory and the images on the hard drive can be edited. However, they contain binary data so editing them with the System Editor is very difficult.

### **Objectives**

At the end of this exercise you should be able to:

- Use an INI editor to view the contents of the two INI files.
- Make changes to the INI files and save the results.

### **Reference**

- NOTE: EDITINI is the name of the zip file on the bulletin board.(EDTINI.ZIP)
- Provided with the program, is documentation on how to use the program. (EDITINI.ABS)

### **Steps**

1. Look at the raw OS2.INI and OS2SYS.INI using the System Editor.
2. You will note that the contents is not easily readable.
3. Locate a program in the \LABS\ sub-directory called EDTINI.ZIP
4. Use the Pkunzip program also located in the \LABS\ directory to unzip the file.
  - An example of using PK:  
PKUNZIP D:\LABS\EDTINI.ZIP D:\LABS
5. Build a desktop reference for EDITINI.
6. Start the program and view the OS2.INI file.
7. Locate Border Width under PM\_CtrloPanel in the pull down list.
8. Change the number, which would normally be 4, to some other number like 9.
9. Do a Shutdown of the system.
10. Why was a Shutdown necessary? \_\_\_\_\_
11. Re-boot your system and verify that the expected change took place.



---

## **OS/2 Maintenance and Recovery Lab 7**

### **Re-create INI files used for recovering a user-locked machine.**

#### **Background**

One of the nice features of OS/2 is to lock up your system to prevent other individuals from getting into it. You can also have your machine lockup at start up time. Now, if a user has a lockup at startup and has forgotten their password, how would you go about helping this person?

#### **Objectives**

At the end of this exercise you should be able to:

- Know the procedure to unlock a users workstation.

#### **Steps**

1. NOTE: If you search through the on-line documentation, you will not be successful.
2. Try looking up help on the MAKEINI function.
3. Bring up the pop-up menu for the desktop.
4. Select the bottom tab, LOCKUP.
5. Choose the Lock on Startup, then go to page three of LOCKUP.
6. Now have one of your neighbours put in a password.
7. Close the settings notebook for the desktop and again bring up the pop-up menu.
8. Choose Lockup Now.
9. You will be unable to do a Shutdown, therefore, make sure there is no drive activity by looking at the drive light and do a CTRL-ALT-DEL.
10. If a user doesn't have Boot Manager, you will need a diskette in the drive to boot with.
11. Use either a diskette or the Maintenance drive and go to the \OS2 directory.
12. Use the MAKEINI file: MAKEINI OS2.INI LOCK.RC
13. Re-boot your system and verify that the Lock has been removed.



**LABS: OS/2 Printing Support**



---

## Lab Printer Problem Determination

### What these labs are about:

This lab presents a number of problems in the form of print problem scenarios.

### Solutions

Solutions can be found in the Printing Unit of the Student Text.

### Recommended Approach

1. Read each scenario.
2. Refer to the Printer Problem Determination questions listed below.
3. Use the Print Data Flow charts in the Student Text.
4. Refer the Available Support Tools listed below.
5. Complete the **Cause** and the **Solution or Recommended Action** sections in the space provided.
6. Check your solutions in the Student Text.

### Printer Problem Determination

1. What Changed?  
Recent changes to Hardware? Configuration? Application?
2. Print Elsewhere?  
Test printing from other applications.
3. None or Incorrect Printout?  
No output suggests a hardware problem.  
Incorrect output suggests a printer driver problem.
4. Type of Application/Data Flow?  
Queued PM? Direct PM? WIN-OS2? or Non-PM, Non-WIN-OS2?
5. Expected Route?  
Based on Type of Application, spooler(s) enabled, serial or parallel port?
6. Distance en Route?  
Spooling? Waiting? Held? Printing? Error?
7. Suspect component?  
Based on the distance traveled along the actual print data flow route.
8. Correct & Test!

## **Available Support Tools**

- On-line Help
- Student Text - OS/2 Print Topic
- Student Text - Appendix
- On-line Files

## **Print Problem Scenarios**

### **Scenario #1**

***Title - No Output Printed***

***Description***

User received a "PMV0008: The printer is not on-line" error message. Nothing prints today, worked fine yesterday.

***Cause***

***Solution or Recommended Action***

## Scenario #2

### ***Title - Job Prints Incorrectly***

#### ***Description***

- The first characters of a printout are incorrect.
- Printout consists of a few odd symbols at the top of each page.
- Printout did not format correctly.

#### ***Cause***

#### ***Solution or Recommended Action***

## **Scenario #3**

***Title - Job is Spooled, Queued, then Disappears***

***Description***

Job does not print. Print Job Object is seen spooling, queued, and then sent to printer.

***Cause***

***Solution or Recommended Action***

## **Scenario #4**

**Title - Printing works with DOS, but not with OS/2**

**Description**

Recently upgraded to OS/2. Cannot print when running OS/2. When running Native DOS, printing works as before.

**Cause**

**Solution or Recommended Action**

## **Scenario #5**

**Title - "Forms Mismatched" message**

**Description**

User received a "Forms Mismatched" error message.

**Cause**

**Solution or Recommended Action**

**Scenario #6**

***Title - Printing seems Slow***

***Description***

Printing seems slow.

***Cause***

***Solution or Recommended Action***

## **Scenario #7**

### ***Title - Output Combined for Print Jobs***

#### ***Description***

The output from two separate print jobs was combined at the printer.

#### ***Cause***

#### ***Solution or Recommended Action***

**Scenario #8*****Title - WIN-OS2 Job Prints Incorrectly******Description***

WIN-OS2 job prints incorrectly. Strange characters and/or not properly formatted.

***Cause******Solution or Recommended Action***

## **Scenario #9**

**Title - Printing Starts Only When DOS Application Ends**

**Description**

Print job from a DOS application does not begin printing until the application is ended. Can continue to print from anywhere else. The job object status remains at "Job Spooling" until the DOS application is ended.

**Cause**

**Solution or Recommended Action**

## **Scenario #10**

***Title - Can Print ONLY from DOS Application***

***Description***

When a specific DOS Application is running, all other printing is held.

***Cause***

***Solution or Recommended Action***

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

(

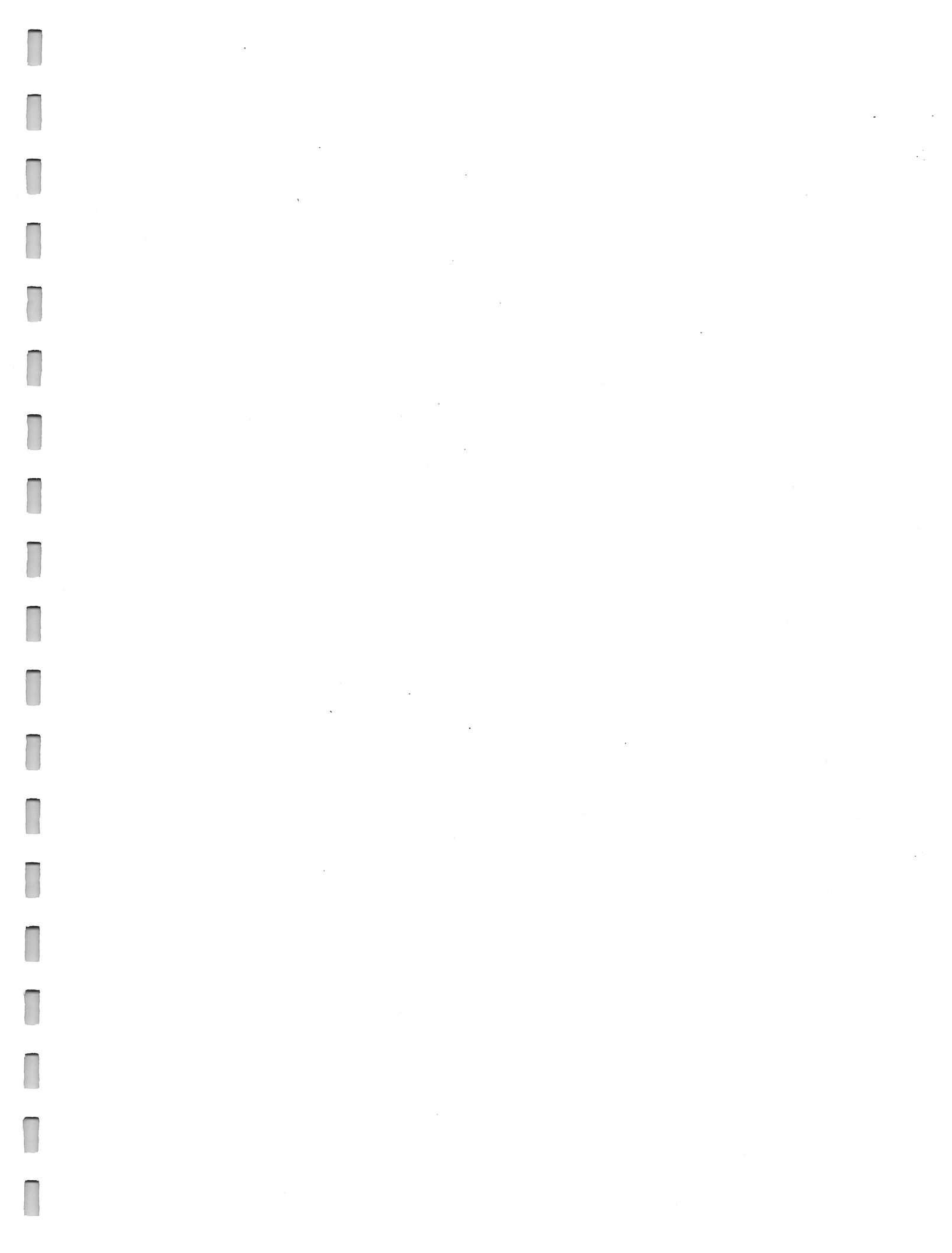
(

(

## **Configuration file on the student machine**

Note: This may not be identical to the configuration file on your machine. The key components will be the same, but this file may have more (or less) statements than your machine.

```
DEVICE=D:\OS2\MDOS\VCDROM.SYS
DEVICE=D:\OS2\MDOS\VWIN.SYS
REM DEVICE=D:\OS2\PCMCI.A.SYS
REM DEVICE=D:\OS2\MDOS\VPCMCI.A.SYS
DEVICE=D:\OS2\OS2CDROM.DMD /Q
IFS=D:\OS2\CDFS.IFS /Q
BASEDEV=OS2SCSI.DMD
DEVICE=D:\OS2\MDOS\VMOUSE.SYS
DEVICE=D:\OS2\POINTDD.SYS
DEVICE=D:\OS2\MOUSE.SYS
DEVICE=D:\OS2\COM.SYS
DEVICE=D:\OS2\MDOS\VCOM.SYS
CODEPAGE=437,850
DEVINFO=KBD,US,D:\OS2\KEYBOARD.DCP
DEVINFO=SCR,VGA,D:\OS2\VIOTBL.DCP
SET VIDEO_DEVICES=VIO_VGA
SET VIO_VGA=DEVICE(BHVGA)
DEVICE=D:\OS2\MDOS\VVGA.SYS
SET IPFC=E:\TOOLKT21\IPFC;
SET INCLUDE=E:\TOOLKT21\C\OS2H;E:\TOOLKT21\C\OS2H\VDD;
          E:\TOOLKT21\ASM\OS2INC;
SET LIB=E:\TOOLKT21\OS2LIB;
```



# Appendix A: Diagnosing System Problems

This information was copied from the *OS/2 2.1 Installation Guide*, Appendix B.

## Messages on Screen

If you receive one of the following error messages while installing the operating system, take the appropriate correctable action.

**Only some files were copied. You may be out of disk space.**

**Explanation:** The installation program stopped transferring files because there was not enough hard disk space available.

**Action:** Move non-OS/2 operating system files out of the installation partition. You can store these files in another partition or on a diskette. If you intend to format the installation partition, remember to first use the BACKUP command to save any important files.

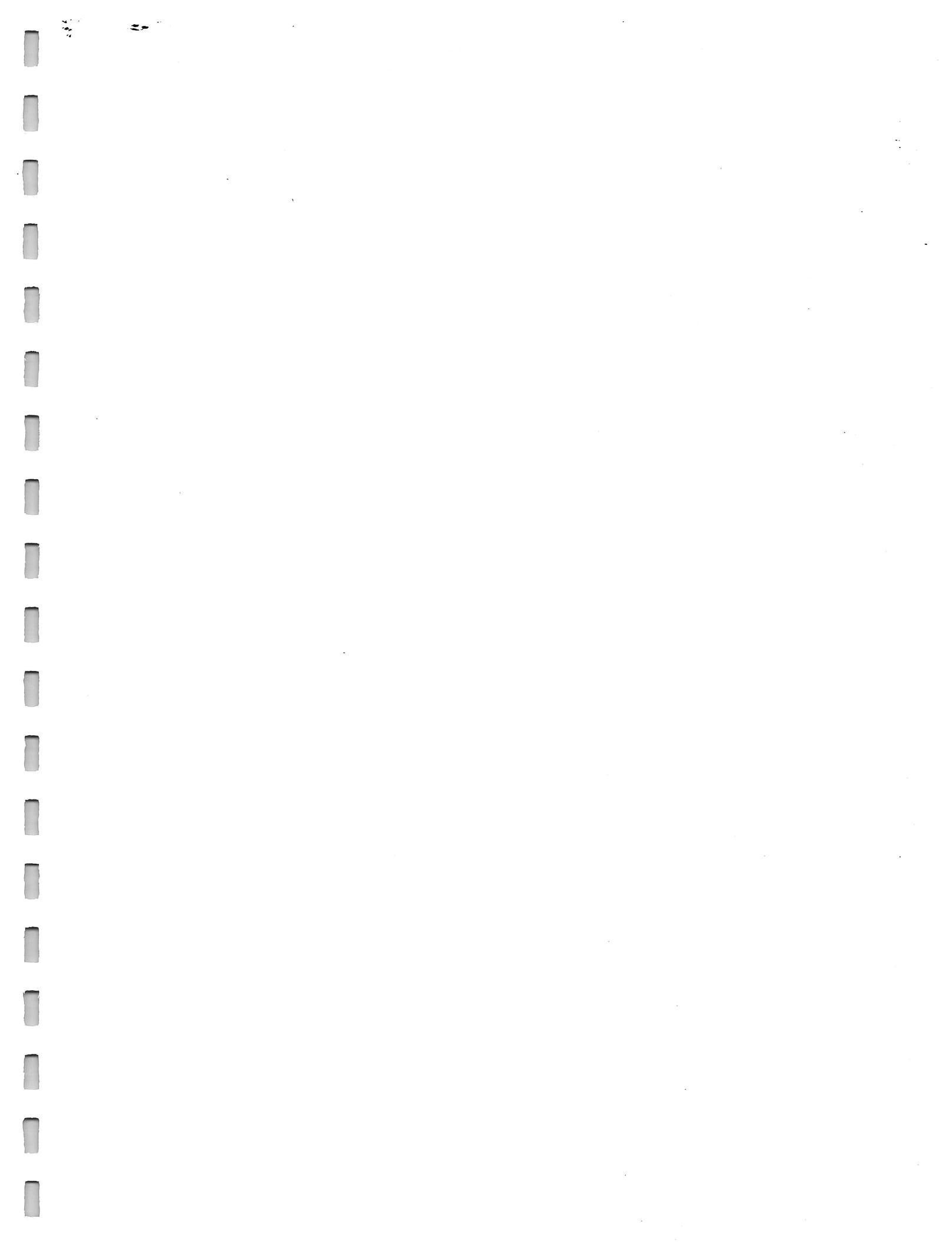
**An error occurred when System Installation tried to copy a file.**

**Explanation:**

- (1) The installation diskette might contain errors.
- (2) The installation program stopped transferring files because there was not enough hard disk space available.
- (3) The hard disk might contain errors.

**Action:**

- (1) Request a replacement diskette.
- (2) Move non-OS/2 operating system files out of the installation partition. You can store these files in another partition or on a diskette. If you intend to format the installation partition, remember to first use the BACKUP command to save any important files.
- (3) Follow the CHKDSK procedure.



**An error occurred when System Installation tried to transfer system files to your hard disk. Your hard disk might be unusable.**

**Explanation:** The installation program stopped transferring files because an error occurred while the boot record was being written.

**Action:** Format the installation partition and restart the installation. Remember to first use the BACKUP command to save any important files.

**System Installation failed trying to load a module into memory.**

**Explanation:** The installation program could not load a system module because there is not enough memory.

**Action:** Add more system memory (RAM).

**An error occurred when System Installation tried to allocate a segment of memory.**

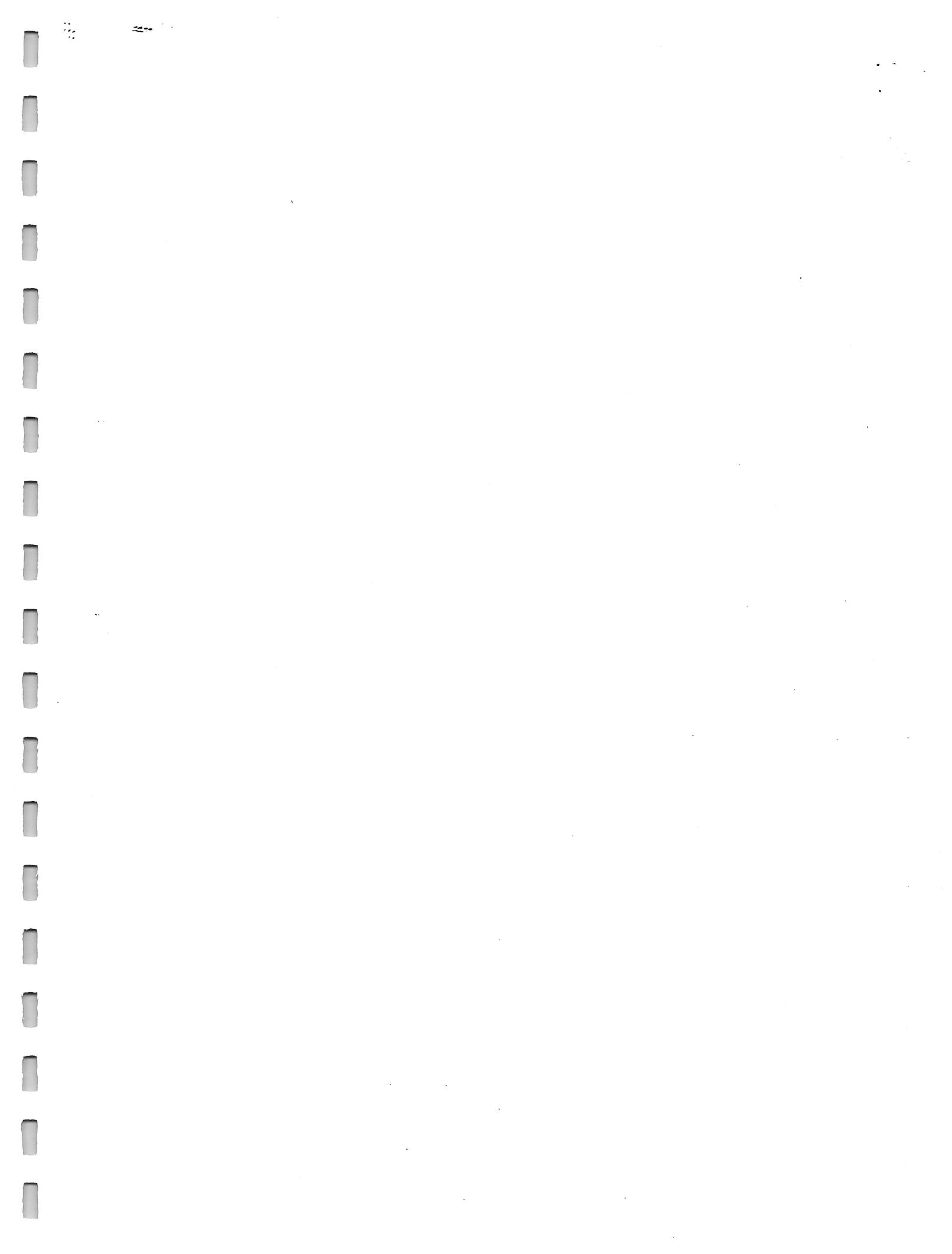
**Explanation:** The installation program could not allocate a segment of memory because there is not enough memory.

**Action:** Add more system memory (RAM).

**FDISK unsuccessful**

**Explanation:** Your hard disk controller might not be supported.

**Action:** Make a copy of *Diskette 1*. Locate the Device Support Diskette supplied by the manufacturer of your hard disk controller. Copy the OS/2 device driver from that Device Support Diskette onto the copy of *Diskette 1*. Then add the statement BASEDEV=xxxSYS (where xxx is the name of the device driver) to the CONFIG.SYS file on the copy of *Diskette 1*, and restart the installation.



**COUNTRY.SYS file cannot be found**

**Explanation:** This message almost always means that the OS/2 operating system does not recognize the hard disk or diskette.

- (1) If you have a PS/2 P70, you need to request an engineering change.
- (2) A diskette drive or a hard disk drive controller might have an additional device (such as a tape backup) attached to it.
- (3) The diskette drive or hard disk drive controller might not reside at its own *interrupt request* (IRQ) level.
- (4) The hard disk partition on which you are installing OS/2 2.1 was compressed with a DOS data compression program.

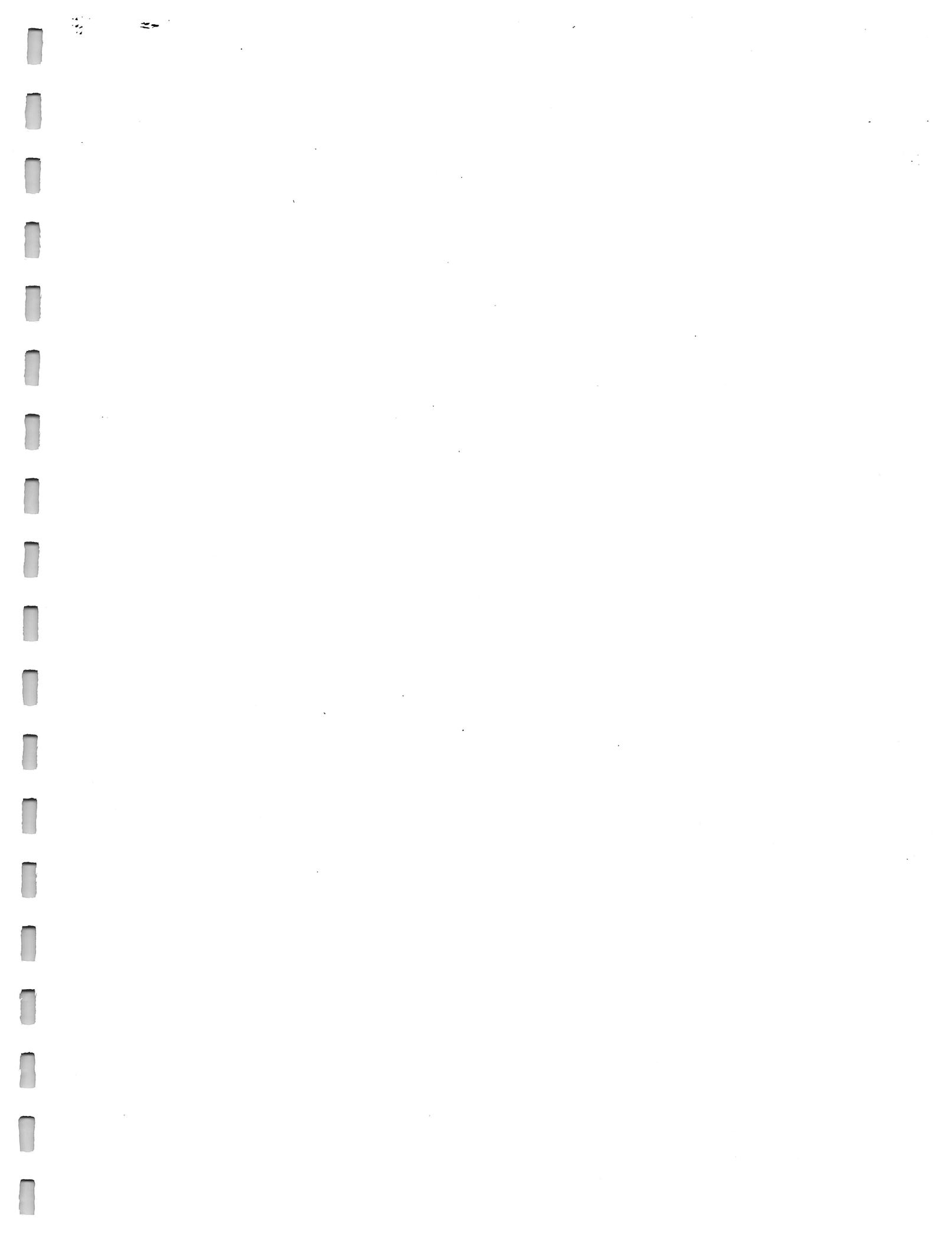
**Action:**

- (1) Contact your IBM customer engineer or computer dealer and request the engineering change announcement "ECA068".
- (2) Disconnect the device, if possible.
- (3) Refer to the operations manual that came with your computer for information about the IRQ setting. (Refer to *OS/2 2.1 Using the Operating System* for more information about setting IRQ levels.)
- (4) Use the data compression program to decompress the partition, and then retry the installation.

**TRAPxxx**

**Explanation:** Messages that include the word "TRAP" followed by a number or letter are almost always related to memory or hardware problems.

- (1) Your computer system might have single in-line memory modules that were produced by different manufacturers or that operate at different speeds. Or, your computer system might have different classes of single in-line memory modules. (For example, a 1x9 module cannot be mixed with a 1x3 module.)
- (2) If your computer has an 80486 microprocessor, your computer might require faster RAM chips (60ns or 70ns).



- (3) There might be a problem with caching or other memory parity errors.

**Action:**

- (1) Remove any defective single in-line memory module. It might also be necessary to replace one or more modules.
- (2) From the Diagnostics screen of your computer, disable shadow RAM.
- (3) Disable caching during installation or turn the turbo switch off.

**SYS1200 and EC=00BF**

**Explanation:** The DOS environment cannot be created.

**Action:** If you see the error message SYS1200 while attempting to use the Dual Boot feature to change to DOS, and you also see error code EC=00BF, check your CONFIG.SYS file. Make sure your virtual DOS device drivers have not been remarked out of or removed from your CONFIG.SYS file. If necessary, look at the CONFIG.SYS file in the OS2\INSTALL directory (the CONFIG.SYS file as it was originally installed) to see how the DOS device drivers should be listed.

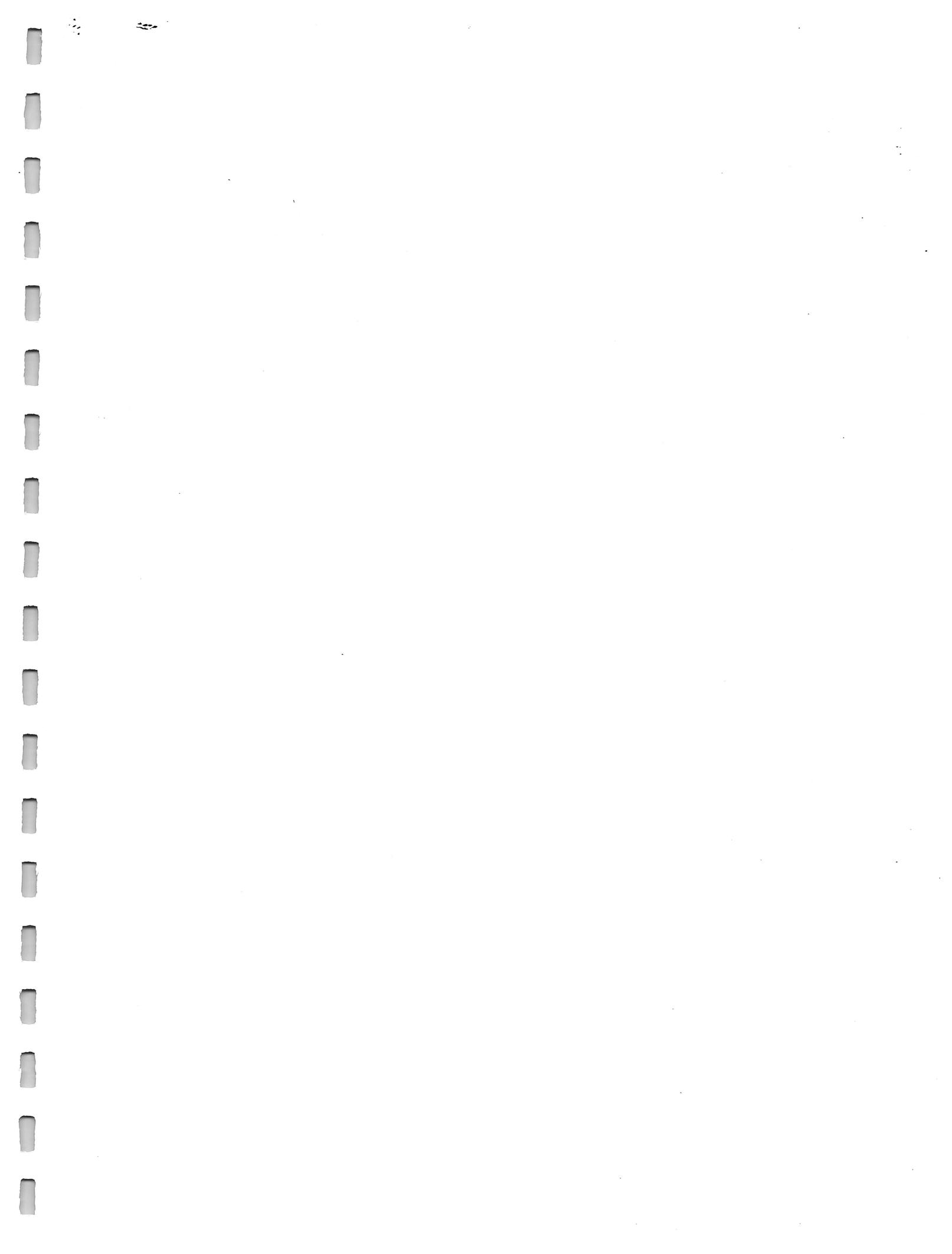
**SYS1475**

**Explanation:** The file OS2BOOT cannot be found. This is a hidden system file and must reside in the root directory of the drive from which the operating system is started.

**Action:** Insert a system diskette and restart the system. If this file is missing from the hard disk, first try the following procedure:

1. Insert the *Installation Diskette* into drive A.
2. Turn on the computer. If the computer is already on, press and hold Ctrl+Alt, and press Delete to restart the system.
3. When you are prompted to do so, remove the *Installation Diskette* and insert *Diskette 1*.
4. Press Enter.
5. When the Welcome screen is displayed, press Esc to display the command prompt.
6. Reinsert the *Installation Diskette*.
7. Type **SYSINSTX C:** and press Enter. (If your operating system resides on a drive other than C, use the appropriate drive letter instead.)

If this procedure does not correct the problem, it might be necessary to reinstall the operating system.



**SYS2025**

**Explanation:** A disk read error occurred. This might be a disk error or a damaged system boot record.

**Action:**

- (1) If this error occurred while the system was loading, follow the procedure under "Recovering from Errors on the Hard Disk" in the *OS/2 2.1 Installation Guide*.
- (2) If this error occurred when the system was reading the installation diskettes, there might be an error on the diskette. If you already have an operating system installed on your computer, use the DISKCOPY command to make a copy of the installation diskettes. Retry the installation with the newly copied diskettes.
- (3) If the error is from the hard disk, it might be necessary to format the hard disk and reinstall the operating system. If the problem still persists, contact your service representative.
- (4) If your computer has BIOS supplied by American Megatrends, Inc. (AMI\*\*, a trademark of American Megatrends, Inc.) you might need to upgrade the BIOS.

**SYS2026**

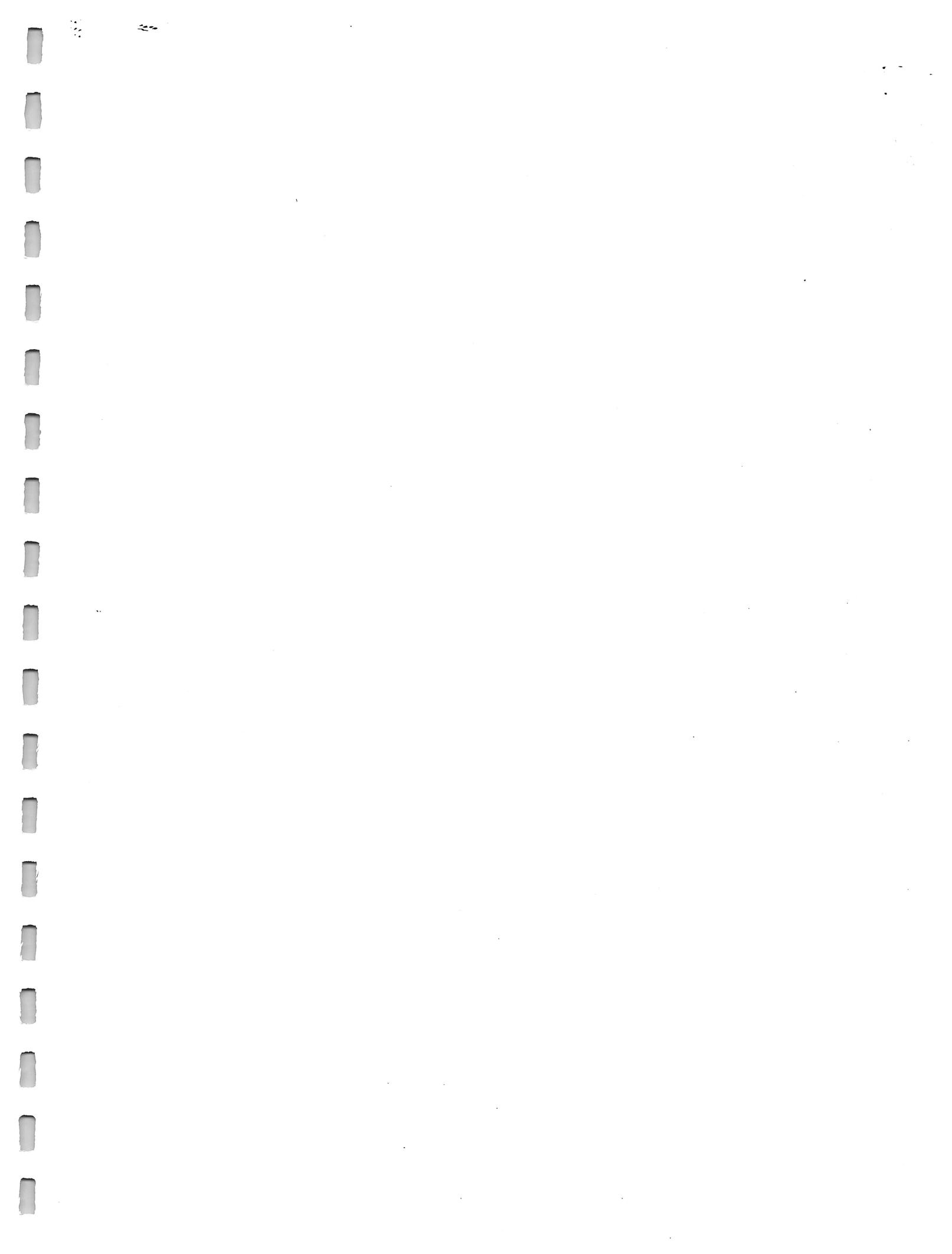
**Explanation:** The file OS2LDR cannot be found. This is a hidden system file and must reside in the root directory of the drive from which the operating system is started.

**Action:** Insert a system diskette and restart the system. If this file is missing from the hard disk, reinstall the operating system.

**SYS2027**

**Explanation:** The system must be restarted. This message usually accompanies message SYS2025. See the explanation and actions for that message for more specific information.

**Action:** Insert a system diskette and restart the system.



**SYS2028**

**Explanation:** The system cannot find the OS2KRNL file. This is a hidden system file and must reside in the root directory of the drive from which the operating system is started.

**Action:** Insert a system diskette and restart the system. If this file is missing from the hard disk, reinstall the operating system.

**SYS2029**

**Explanation:** The file OS2KRNL is not acceptable. The file might be damaged.

**Action:** Reinstall the operating system.

**SYS2030**

**Explanation:** The system does not have enough memory to start the operating system.

**Action:** Add more system memory (RAM).

**SYS3146**

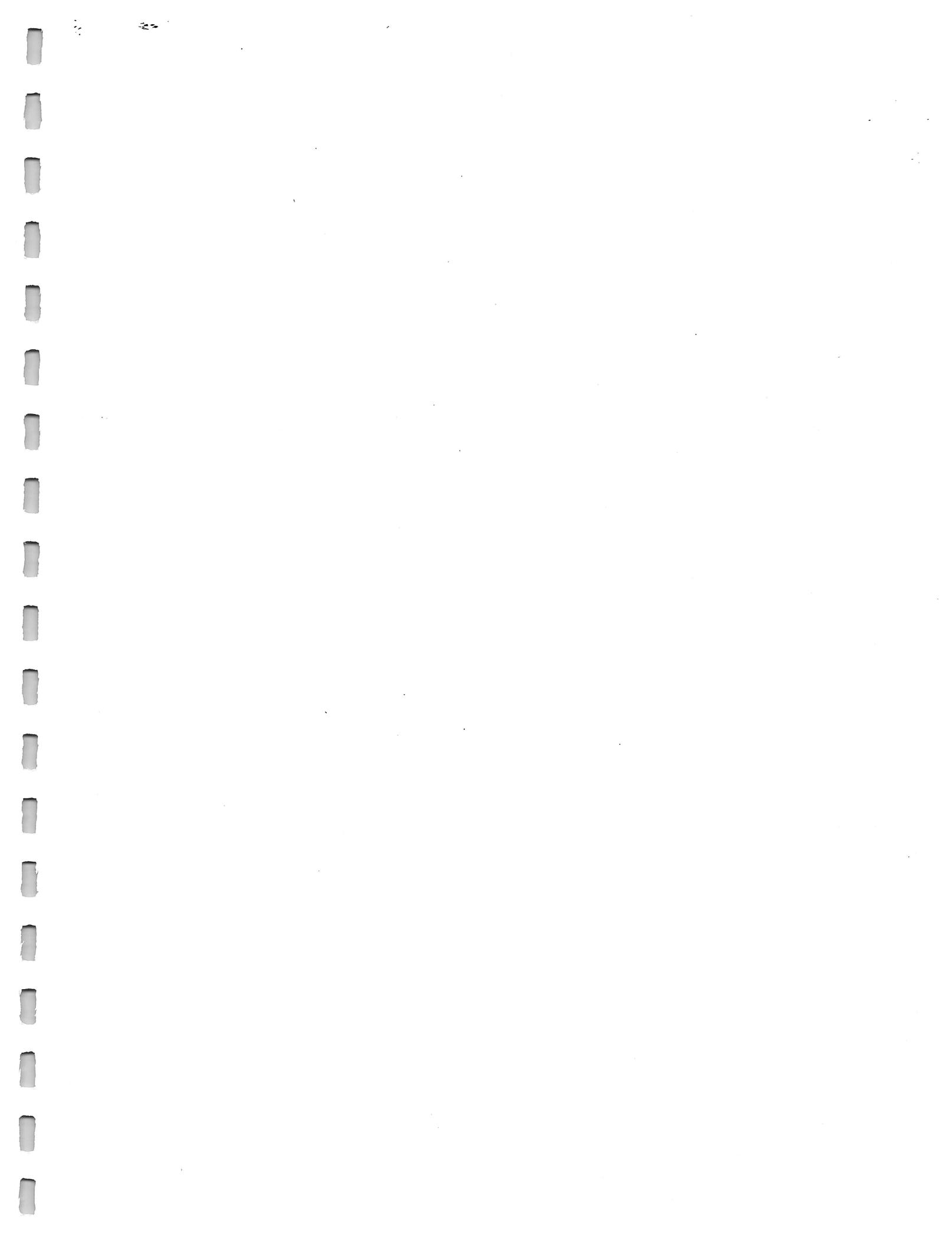
**Explanation:** The system cannot find the OS2LDR.MSG file. This is a hidden system file and must reside in the root directory of the drive from which the operating system is started.

**Action:** Insert a system diskette and restart the system. If this file is missing from the hard disk, reinstall the operating system.

**SYS3147**

**Explanation:** The OS2LDR.MSG file is not acceptable. The file might be damaged.

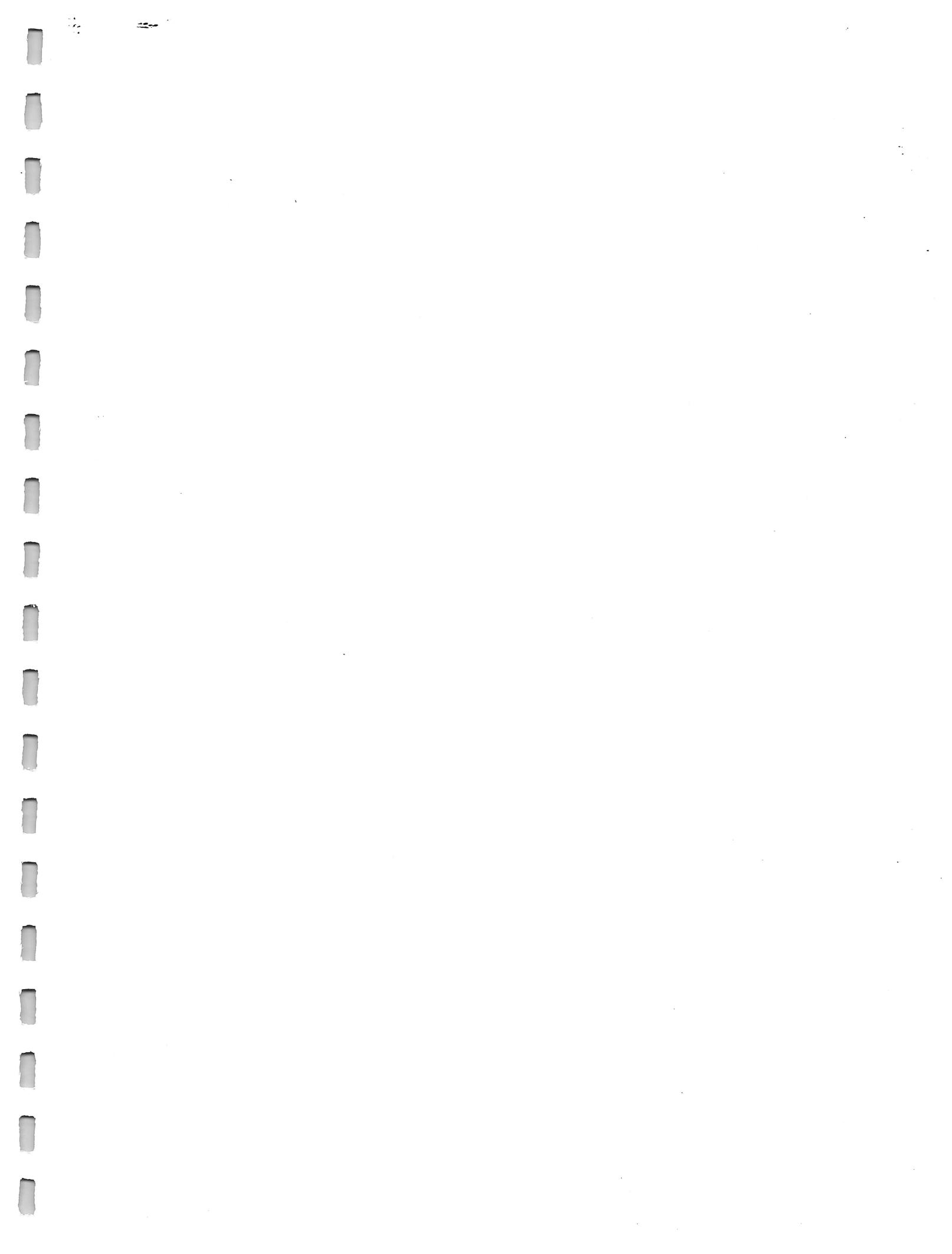
**Action:** Reinstall the operating system.

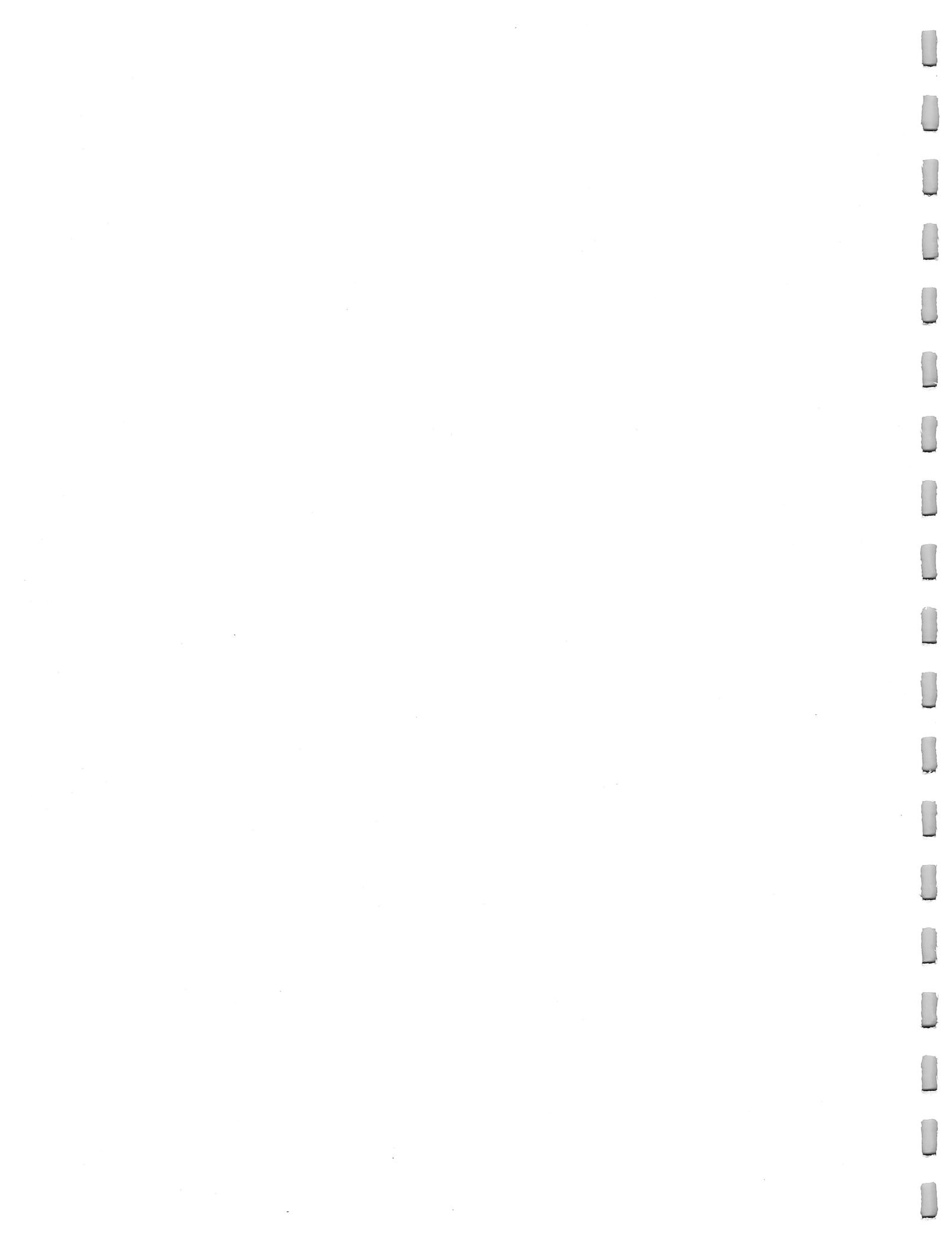


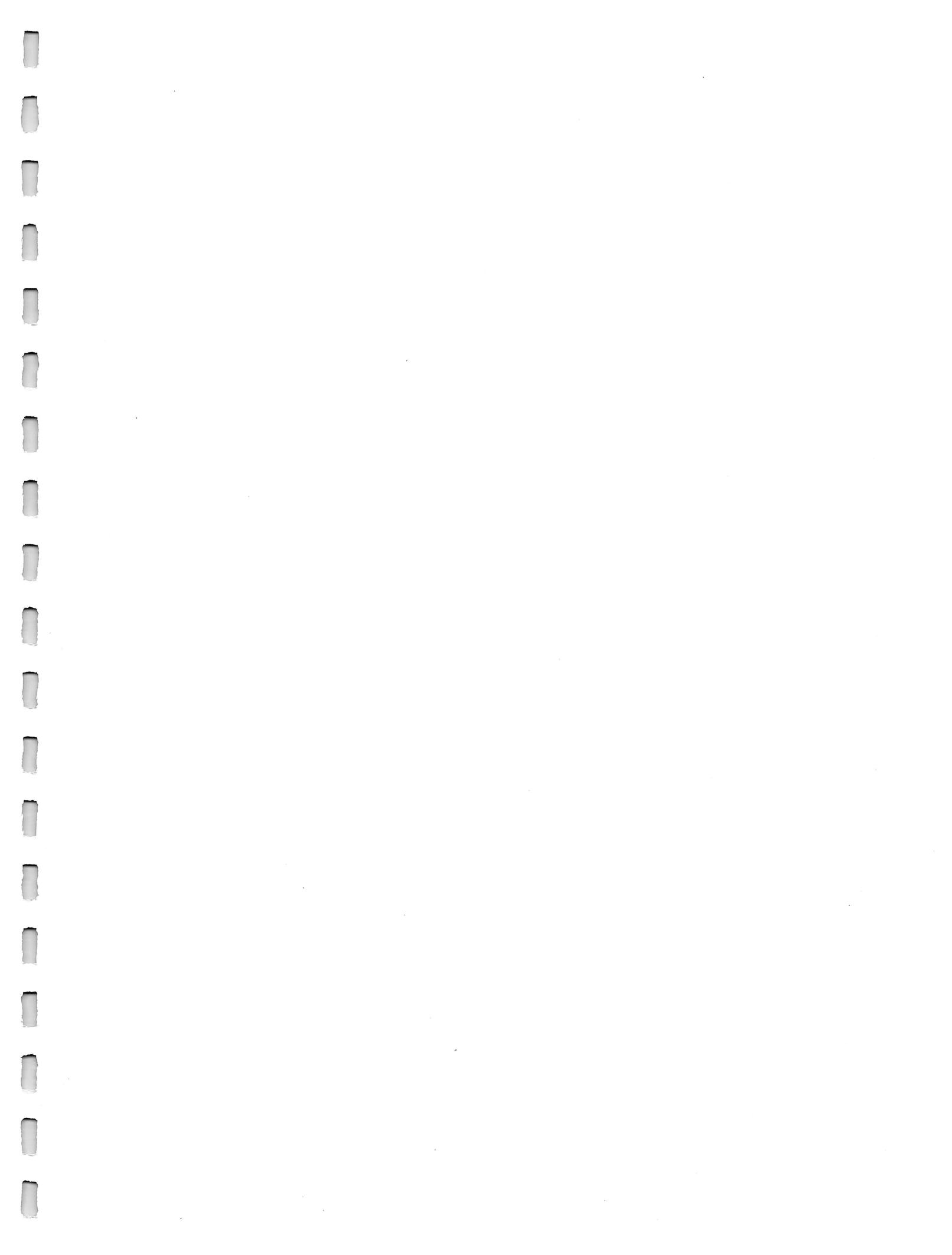
SYS3161

**Explanation:** The system detected an 8086, 8088, or 80286 processor. These processors are not supported by this version of the OS/2 operating system.

**Action:** Upgrade your system so that your processor is compatible with the 80386 processor.







1

2

3

4

5

6

7

8

9

10

11

12

13

14

15

16

17

18

19

---

## **Video Appendix**

1 November 1993

### S3 Video Accelerator Driver for OS/2 2.1

THIS VIDEO DEVICE DRIVER AND THE MAINTENANCE FIXES ARE DESIGNED TO BE USED WITH THE OS/2 2.1 PRODUCT. YOU MUST BE A CURRENT LICENSEE OF OS/2 2.1 IN ORDER TO USE THIS PRODUCT. THIS CODE IS GOVERNED BY THE TERMS AND CONDITIONS OF THE OS/2 PROGRAM LICENSE AGREEMENT.

This package contains an OS/2\* 2.1 video accelerator driver supporting the 86C801/86C805 and 86C928 chip sets from the S3\*\* Corporation. These chip sets are found on many leading video display adapters, including Actix\*\*, Artist Graphics\*\*, Diamond Stealth\*\*, Focus\*\*, Metheus\*\*, MiroMAGIC, Nth Graphics\*\*, Number Nine\*\*, Orchid\*\*, PCG\*\*, Vermont\*\*, Video 7\*\*, Volante\*\* and on the system boards of leading hardware systems, such as those from the IBM\* Corporation and the Dell\*\* Computer Corporation.

This package also contains:

- o This README with instructions for installing the driver from a diskette or using the Configuration Installation Distribution (CID) environment.
- o Maintenance updates to OS/2 2.1 required for the successful operation of the driver.

#### SUPPORTED FEATURES

-----

This S3 video accelerator driver provides seamless support for accelerated video graphics and advanced color resolutions when used with the minimum required video memory. It conforms to the OS/2 2.1 32-bit flat memory model and is designed to function as a 32-bit Presentation Manager\* display driver under the OS/2 2.1 32-bit graphics engine.

This video accelerator driver supports these resolutions and colors depths:

Number of Resolutions	Video Colors	Memory Required
640x480	256	1MB
800x600	256	1MB
1024x768	256	1MB
1280x1024	256	2MB
640x480	65,536	1MB
800x600	65,536	1MB
1024x768	65,536	2MB
640x480	16,777,216	1MB

This S3 video accelerator driver supports the following number of columns and rows in an OS/2 full-screen session:

Columns	Rows
132	25
132	43

#### INSTALLATION INSTRUCTIONS

-----

NOTES:

1. You must have OS/2 DOS Support installed in order to install this driver.
2. The OS/2 ATTRIB command is used during installation. If you elected not to install the OS/2 System Utility Programs or you have deleted the ATTRIB, command you must use Selective Install to restore the ATTRIB command before continuing.
3. If you previously installed SVGA support, return to VGA resolution using the new SETVGA procedure found at the end of this README before you install this driver.

INSTALLATION FROM DISKETTE

---

This video accelerator driver is compatible with OS/2 2.1. Do not install it on previous versions of OS/2.

To install this S3 video accelerator driver from diskette:

1. Place this diskette into drive A (or any other diskette drive).

2. Open an OS/2 full-screen or OS/2 window session.

3. At the OS/2 command prompt, type the following command:

A&colonS3INST A: C:

where: A: is the diskette drive  
C: is the drive where OS/2 2.1 is installed

This command will copy all necessary files to the OS/2 drive.

4. Remove the diskette from the diskette drive, perform a shutdown, and then restart the system.

5. Open the "OS/2 System" folder.

6. Open the "System Setup" folder.

7. Open the "Display Driver Install" (DSPINSTL) object.

When the Display Driver Install window appears, "S3" should be the default choice. Select "OK".

When the Monitor Configuration/Selection Utility window appears, the "Install Using Defaults for Monitor Type" option is preselected. You can accept this option or select the "Install Using Display Adapter Utility Program" option.

NOTE: If you select the Install Using Display Adapter Utility Program option, follow the instructions on your screen. For additional information about this option, you can refer to pages 114 and 115 in the "OS/2 2.1 Installation Guide".

8. When the source directory pop-up window appears, insert the S3 Video Accelerator Driver diskette and select Install.

DSPINSTL determines the hardware configuration by creating the SVGADATA.PMI file on the drive where the OS2 directory is located. If the SVGADATA.PMI file has not been created, the adapter will not be supported.

9. When the installation is complete, do the following:

- a. Open "OS/2 System".
- b. Open "System Setup".
- c. Open the "System" object. The Screen page of the Settings notebook lists all the supported resolutions for your configuration.
- d. Select a resolution; then, close the notebook.

10. Perform a shutdown; then, restart the system.

Note that during the installation of this driver a DISPLAY.LOG file is created in the OS2\INSTALL directory. This file identifies the OS/2 2.1 system files that were updated and indicates whether the installation was successful. The contents of this file might be useful if you need to report an installation problem to IBM.

#### COMPATIBILITY

---

This video accelerator driver is compatible with OS/2 2.1. Do not install it on previous versions of OS/2.

IBM has tested many display adapters containing the S3 chips sets. Those that have tested successfully are listed in this README file. However, certain display adapters in combination with certain chip sets might not be supported. IBM is continuing to test; therefore, support for additional combinations is expected to be added over time.

S3 Adapters/Systems	Chipsets
Actix GraphicsENGINE 32	801
640x480x256	
800x600x256	
1024x768x256	
1280x1024x256	
640x480x64K	
800x600x64K	
1024x768x64K	
640x480x16M	

Actix GraphicsENGINE 32 LB	805
----------------------------	-----

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Actix GraphicsENGINE ULTRA 928

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Artist Graphics\*\* Winsprint 928

640x480x256  
800x600x256  
1024x768x256

Diamond Stealth 24\*\* 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Diamond Stealth 24 LB\*\* 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Diamond Stealth Pro\*\* 928

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Diamond Stealth Pro LB\*\* 928

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Focus 2 The Max Truespeed 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Metheus (Brooktree DAC) 928

640x480x256  
800x600x256  
1024x768x256

Metheus (AT&T\*\* DAC) 928

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K (BIOS 2.1 required)  
800x600x64K (BIOS 2.1 required)  
1024x768x64K (BIOS 2.1 required)

640x480x16M (BIOS 2.1 required)

MiroMAGIC S4 LB 928

640x480x256  
800x600x256  
1024x768x256

National Design Volante\*\* Warp 10 LB 805

640x480x256  
800x600x256  
1024x768x256

640x480x64K  
800x600x64K

640x480x16M

Nth Graphics\*\* S3 Advantage 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Nth Graphics S3 Advantage LB 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Number Nine\*\* #9\*\* GXE (Brooktree DAC) 928

640x480x256  
800x600x256  
1024x768x256

Number Nine #9 GXE (AT&T DAC) 928

640x480x256  
800x600x256  
1024x768x256

Orchid Fahrenheit\*\* 1280 Plus 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K

800x600x64K  
1024x768x64K

640x480x16M

Orchid Fahrenheit LB 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

PCG\*\* Photon Torpedo 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K

640x480x16M

PCG Photon Torpedo LB 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K

640x480x16M

Vermont\*\* 801 ISA 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K  
1024x768x64K

640x480x16M

Video 7 Win.Pro\*\* 801

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K  
800x600x64K

640x480x16M

IBM PS/ValuePoint\* 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

640x480x64K (BIOS L6ET53A required)  
800x600x64K (BIOS L6ET53A required)  
1024x768x64K (BIOS L6ET53A required)

640x480x16M (BIOS L6ET53A required)

Dell 805

640x480x256  
800x600x256  
1024x768x256  
1280x1024x256

#### FUNCTIONAL RESTRICTIONS

---

- o After Dark\*\* for Windows\*\* images that move from left to right do not perform properly at 640x480x16M resolution.
- o To avoid a General Protection fault while loading Ventura Publisher\*\* for Windows be sure it is in one of the 256 color resolutions.
- o To avoid a trap in Lotus\*\* 1-2-3\*\* for OS/2 do not attempt to run the program at 16.7 million colors.
- o WordPerfect\*\* 5.1 and 5.2 for Windows produce a general protection fault when the "Print Preview" option is selected while using 800x600x64K or 600x480x16 million color mode.
- o Users of the software motion video feature of MMPM/2 should expect satisfactory results in 256-color modes. However, in 64K-color modes, users of the feature will experience unusual results. An OS/2 2.1 pervasive fix package will be available electronically. The software motion video feature is not supported in 16 million color modes.

In addition, the software motion video feature will take advantage of a 1MB aperture on video adapters and systems where it is available to improve the performance of video playback in 64K-color modes. For those systems with nonstandard locations,

the actual physical address of the aperture must be provided in the following CONFIG.SYS statement:

```
SET VIDEO_APERTURE=xxxx
```

where "xxxx" is a hexadecimal value in units of 1MB, representing the actual physical address to map to the aperture. For example, the IBM PS/ValuePoint Systems must have the statement:

```
SET VIDEO_APERTURE=400h
```

to use a physical address at 1GB.

#### INSTALLATION IN A CID ENVIRONMENT

---

##### NOTES:

1. The server must contain a directory named S3\_DRVS on the same drive where the OS/2 2.1 diskettes reside. The S3\_DRVS directory must contain all of the files from the S3 Video Accelerator Driver diskette.
2. OS/2 2.1 must have been successfully installed on the client using the CID Method.

To install the S3 video accelerator driver using CID, use the following information to modify your LCU command file.

NOTE: The following information is meant as a guide, your LCU command file might be different.

```
*****  
/*      LCU PRODUCT DATA SECTION          */  
*****  
  
x.s3video = 15  
x.15.name='S3 Video'  
x.15.statevar = 'CAS_ ' || x.15.name  
x.15.instprog = 'x:\img\s3_drvs\S3INST.CMD',  
' x:\img\s3_drvs ' || bootdrive || '/cid'  
x.15.rspdir = ''  
x.15.default = ''  
  
x.s3dspinstl = 16  
x.16.name='S3 CID Dspinstl'  
x.16.statevar = 'CAS_ ' || x.16.name  
x.16.instprog = bootdrive || '\os2\install\DSPIINSTL.EXE',  
' /pk:SVGA',  
' /sk:NONE',  
' /s:x:\s3_drvs',  
' /t: ' || bootdrive,  
' /mc:8'  
x.16.rspdir = ''  
x.16.default = ''  
  
/*-----*/  
/*  NUMBER OF PROGRAMS SET UP IN THE    */  
/*-----*/
```

```

/* PRODUCT DATA SECTION      */
/*-----*/
NUM_INSTALL_PROGS = 16

/*********************************/
/* INSTALLATION SECTION      */
/*********************************/

```

```

when OVERALL_STATE = 2 then do
    if RunInstall(x.s3video) == BAD_RC then exit
    Call CheckBoot
end
when OVERALL_STATE = 3 then do
    if RunInstall(x.s3dspinstl) == BAD_RC then exit
    Call CheckBoot
end

```

end

exit

```

/*********************************/
END OF LCU INFORMATION TO BE ADDED
/*********************************/

```

Following is an explanation of the line that is executed in the LCU command file:

C:\OS2\INSTALL\DSPINSTL /PK:SVGA /SK:NONE /S:X:\ /T:C: /MC:8

/PK:SVGA where SVGA is the primary adapter key  
/SK:NONE where NONE is the secondary adapter key  
/S:X:\ where X:\ is the redirected source path  
/T:C: where C: is the drive where OS/2 2.1 is installed  
/MC:8 is the manufacturing code that distinguishes S3.

NOTE: After the S3 video accelerator driver has been successfully installed on the client machine using the CID method and the client machine is restarted, the default resolution will be 640x480x256.

#### NEW SETVGA PROCEDURE

---

Use the following procedure instead of the SETVGA command to return to VGA mode.

NOTE: If your display is out of sync, start OS/2 using the OS/2 Installation Diskette, insert Diskette 1 when prompted, then press Esc to access a command prompt. Follow the instructions below to reset your display mode.

- o If you installed OS/2 from diskettes:

1. Be sure RSPDSPI.EXE is in the \OS2\INSTALL directory. If it is, go to step 2. If it is not, insert Installation Diskette 8 and unpack RSPDSPI.EXE with the following command:

C:\OS2\UNPACK A:\INSTAID C: /N:RSPDSPI.EXE

where: A: is the drive containing Installation Diskette 8

C: is the drive where OS/2 2.1 is installed

2. Type C:; then press Enter
3. Type CD C:\OS2\INSTALL; then press Enter
4. Type RSPDSPI /PK:VGA /SK:NONE /S:A:\ /T:C:; then press Enter

/T:C: where C: is the drive where OS/2 2.1 is installed  
/S:A: where A: is the diskette drive you use to install  
OS/2

- o If you installed OS/2 from CD-ROM or a LAN:

1. Be sure RSPDSPI.EXE is in the \OS2\INSTALL directory. If it is, go to step 2. If it is not, unpack RSPDSPI.EXE with the following command:

C:\OS2\UNPACK E:\DISK\_8\INSTAID C: /N:RSPDSPI.EXE

where: C: is the drive where OS/2 2.1 is installed  
E: is the CD-ROM or LAN drive

2. Type C:; then press Enter
3. Type CD C:\OS2\INSTALL; then press Enter
4. Type RSPDSPI /PK:VGA /SK:NONE /S:E:\OS2SE21\ /T:C: then press Enter

/T:C: where C: is the drive where OS/2 2.1 is installed  
/S:E: where E: is the CD-ROM or LAN drive

#### Trademarks

-----

The following terms, denoted by an asterisk (\*) in this file, are trademarks or registered trademarks of IBM Corporation in the United States and/or other countries:

IBM      Presentation Manager  
OS/2     PS/ValuePoint

The following terms, denoted by an asterisk (\*\*) in this file, are trademarks or registered trademarks of other companies as follows:

#### Trademark Owner

-----

Actix      Actix Systems Corporation  
After Dark   Berkely Systems, Inc.  
Artist Graphics   Artist Graphics  
AT&T      American Telephone & Telegraph Company  
Dell      Dell Computer Corporation  
Diamond Stealth      Diamond Computer Systems, Inc.  
Diamond Stealth 24      Diamond Computer Systems, Inc.  
Diamond Stealth 24 LB      Diamond Computer Systems, Inc.  
Diamond Stealth Pro      Diamond Computer Systems, Inc.  
Diamond Stealth Pro LB      Diamond Computer Systems, Inc.  
Fahrenheit      Orchid Technology, Inc.  
Focus      Information Builders, Inc  
Lotus      Lotus Development Corporation  
Metheus      Metheus Corporation

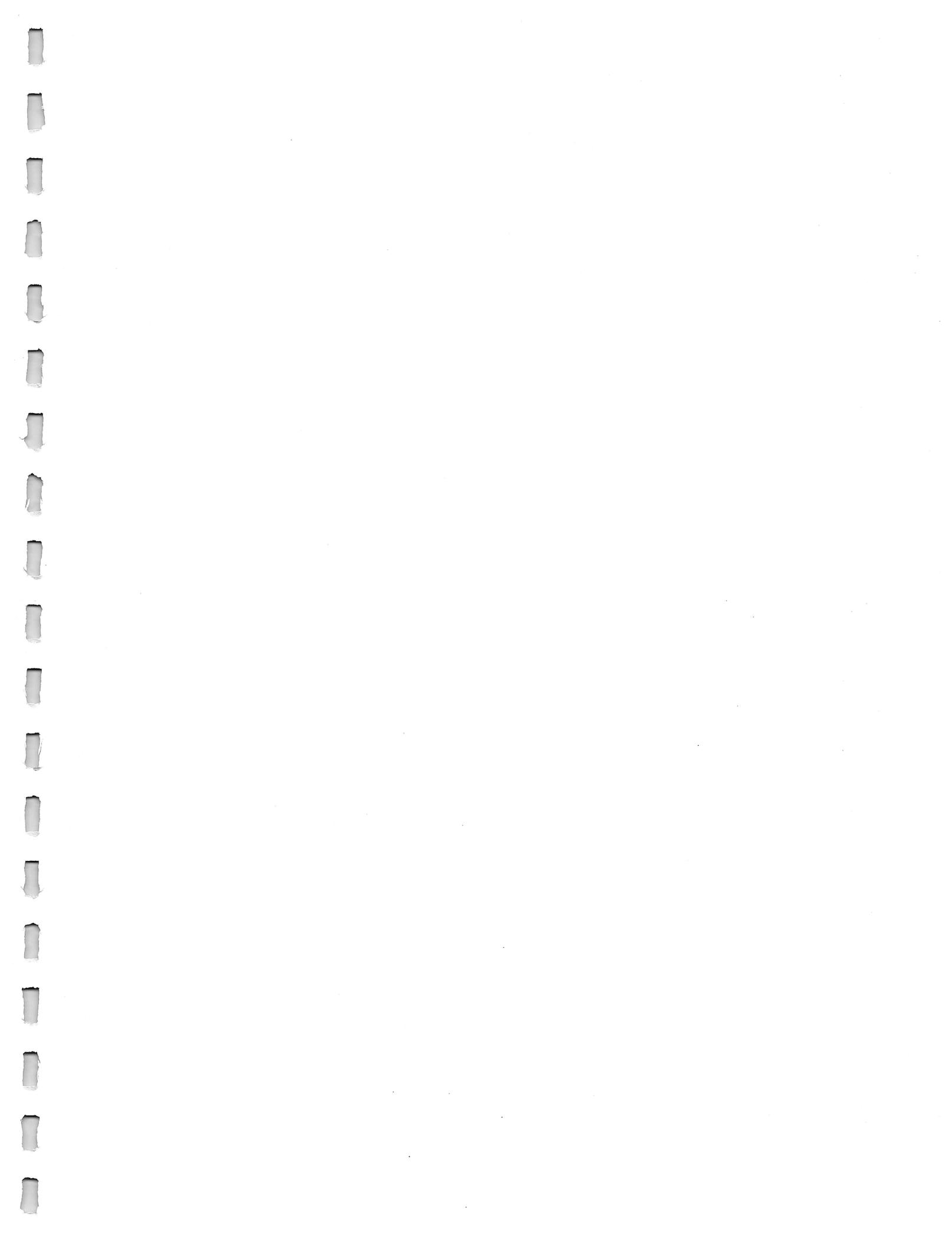
Nth Graphics Nth Graphics  
Number Nine Number Nine Computer Corporation  
Orchid Orchid Technology, Inc.  
PCG Personal Computer Graphics Corporation  
S3 S3 Incorporated  
Ventura Publisher Ventura Software, Inc.  
Vermont Vermont Microsystems  
Video 7 Video Seven, Inc.  
Video 7 Win.Pro Video Seven, Inc.  
Volante National Design INC.  
Windows MicroSoft Corporation  
WordPerfect WordPerfect Corporation  
1-2-3 Lotus Development Corporation  
#9 Number Nine Computer Corporation

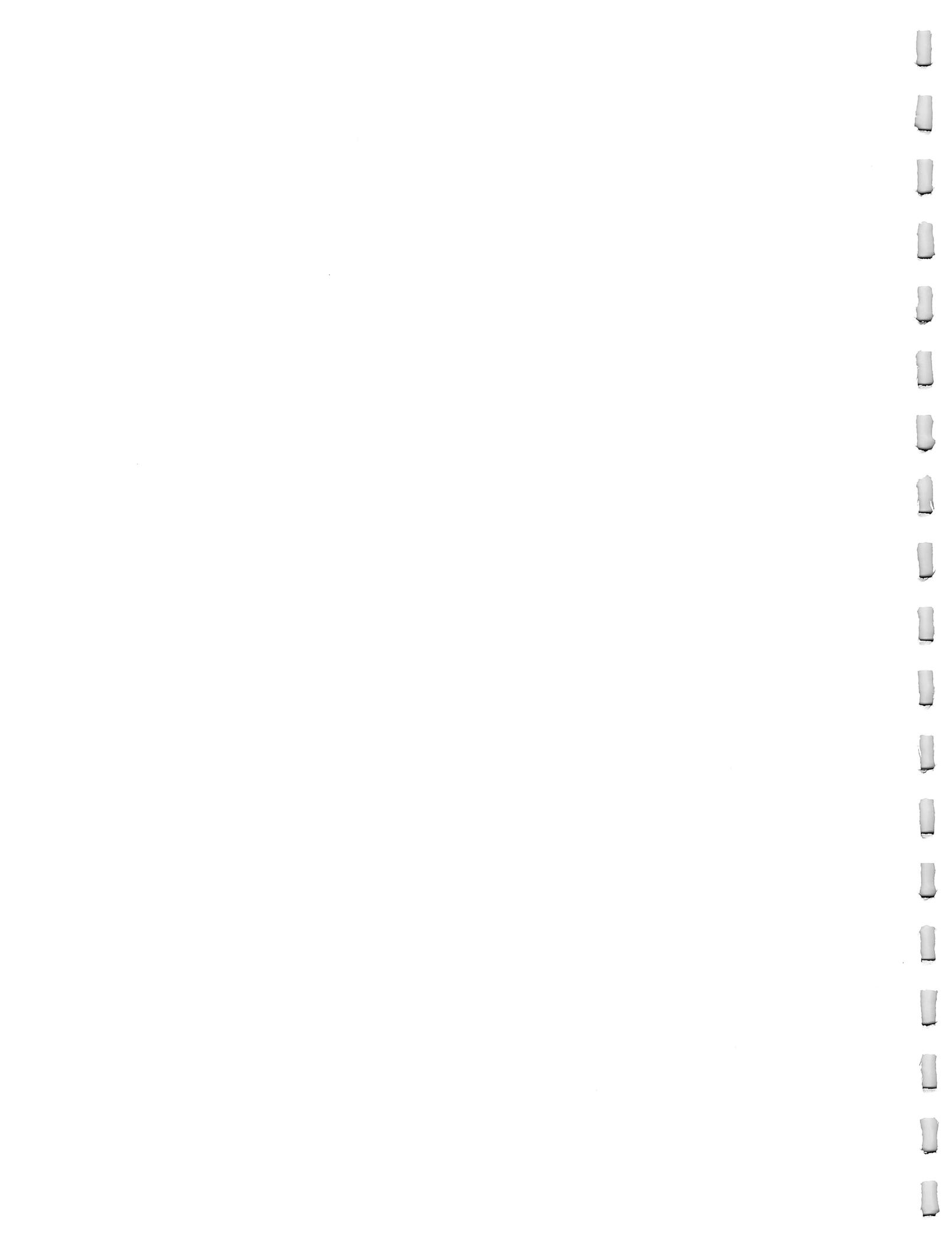
IBM DISCLAIMS ALL WARRANTIES, WHETHER EXPRESSED OR IMPLIED, INCLUDING WITHOUT LIMITATION, WARRANTIES OF FITNESS AND MERCHANTABILITY WITH RESPECT TO THE INFORMATION IN THIS DOCUMENT. BY FURNISHING THIS DOCUMENT, IBM GRANTS NO LICENSES TO ANY RELATED PATENTS OR COPYRIGHTS.

THIS DRIVER IS COPYRIGHTED BY INTERNATIONAL BUSINESS MACHINES CORPORATION. ALL APPROPRIATE RESTRICTIONS APPLY.

(End of Document)







---

## **Print Appendix**



## PRINT APPENDIX

### Topics

- Sample LexMark Drivers
- Print Problems from OS/2 Worldwide Support
- General OS/2 Print Problems
- WINOS2 General Printing Information
- Common Problems with Printing in DOS Applications

### Sample LexMark Drivers

- CONTENT: SAMPLE LEXMARK DRIVERS
- SOURCE: IBM BBS
- DOCUMENT: IBM-FILE.ZIP

The following is a sample listing of the 233 Lexmark Drivers and utilities available on the IBM BBS.

```
è ÂÂÂÂÂè ] Lexmark Drivers
Äè      Äè ] Available: 233 files (28.3 MB)
èè      èè ]
èè      èè ] Newest: OS2PCL5.EXE 1-06-94 (avail: 1-06-94)
```

(part 1 of 2)

Filename	Description
02WP51PP.EXE	Ver 1.00 IBM 6902 Correcting Wheelwriter and IBM 6783 Wheelwriter 10 SeriesII PPDS driver for Wordperfect 5.1.
03WP51PP.EXE	Ver 1.00 IBM 6903 Correcting Quietwriter PPDS driver for Wordperfect 5.1.
05WK20PP.EXE	Ver 1.00 IBM 2205 PS/1 PPDS driver for Microsoft Works 2.0.
05WP50PP.EXE	Ver 1.00 IBM 2205 PS/1 PPDS driver for WordPerfect 5.0 (same as WPRINT41.ALL).
05WP51PP.EXE	Ver 1.00 IBM 2205 PS/1 PPDS driver for WordPerfect 5.1 (subset of WPDM3.ALL).
12WD50PP.EXE	Ver 1.00 IBM 4212 Proprinter 24P PPDS driver for Microsoft Word 5.0 (Dos version).
12WK20PP.EXE	Ver 1.00 IBM 4212 Proprinter 24P PPDS Driver for Microsoft Works 2.0. NOTE: This is Lexmark driver. Call Lexmark for support at (606) 232-3000.
12WP50PP.EXE	Ver 1.00 IBM 4212 Proprinter 24P PPDS driver for WordPerfect 5.0 (same as WPRINT36.ALL).
12WP51PP.EXE	Ver 1.00 IBM 4212 Proprinter 24P PPDS driver for WordPerfect 5.1 (subset of WPDM3.ALL).
193DPJPP.EXE	Ver. 1.00 IBM 4019 LaserPrinter PPDS driver for Perspective Jr.

## **Print Problems from OS/2 Worldwide Support**

- CONTENT: PRINT PROBLEMS AND SOLUTIONS
- SOURCE: IBM OS/2 WORLDWIDE SUPPORT
- DOCUMENT:

The following is a compilation of printer problems and solutions from OS/2 WORLDWIDE SUPPORT.

**Title:** 930716 PRINTING FROM THE UPPER/LOWER TRAYS ON THE  
HP FAMILY PRINTERS UNDER OS/2 2.X

DESCRIPTION OF SYMPTOMS:

Unable to print from the lower tray from an HP Family printer running  
OS/2 2.x.

SUMMARY OF RESOLUTION:

Add a new form and set it for the lower cassette.

NOTE: The steps listed below are ONLY for PM printing. Basic printing  
which is primarily for non-PM programs, including DOS, Windows, non-PM  
OS/2 applications and from the command line.

NOTE: To use one form for the first page of your document and a  
different form for subsequent pages, select the DEVICE DEFAULTS button  
and click on AUTOMATIC MIXED under the paper feed option. This causes  
two lists to appear, one form is selected in the FIRST PAGE list and a  
different form in the REMAINING PAGES list.

**Title:** 930716 INCORRECT CHARACTERS ON PRINTOUT  
WHEN TRYING TO PRINT UNDER OS/2 2.X, SOMETIMES REFERRED  
TO AS ASCII GARBAGE

DESCRIPTION OF SYMPTOMS:

First characters of a printout are incorrect when trying to print under  
OS/2 2.x, sometimes referred to as ASCII garbage.

SUMMARY OF Resolution:

1. Ensure that the correct printer driver is being used.
2. Make sure the printer being used emulated the selected driver 100%. Some printers  
do not fully implement emulation.
3. There is a file named PRDESC.LST located on Printer Driver diskette 1 which lists the supported printers.
4. On Service Pak (XR06055) and above systems, PRDESC.LST can also be  
found in the \OS2\INSTALL subdirectory.

**Title:** 930716 PRINT JOB SPOOLS THROUGH THE LAN BUT  
DOES NOT PRINT ON SYSTEMS RUNNING OS/2 2.X

DESCRIPTION OF SYMPTOMS:

Customer sends a job through the LAN and the printing gets spooled but  
it does not print on systems running OS/2 2.x.

SUMMARY OF Resolution:

Change the line PRINTMONBUFSIZE in the CONFIG.SYS from  
134,134,134 to 2048,134,134. Change should be made on the  
Server to resolve the problem.

NOTE: This sets the parallel-port device-driver buffer size. Each

number corresponds to the buffer size for LPT1, LPT2, or LPT3 respectively. The minimum value that can be specified is 134 bytes and the maximum is 2048 bytes. Changing these values will allow an increase the size to the parallel-port device-driver buffers and thereby increase performance of data transfer to devices connected to the parallel ports.

**Title:** 931011 ERROR STATING FILES ASSOCIATED WITH  
THE PRINTER DRIVER CAN NOT BE UNPACKED MIGHT  
OCCUR WHEN INSTALLING A PRINTER DRIVER IN OS/2 2.1

DESCRIPTION OF SYMPTOMS:

When installing a Printer Driver under OS/2 2.1 an error message stating "The files associated with this printer driver could not be unpacked."

SUMMARY OF Resolution:

1. There are two OS/2 2.1 packages available, one is 6.514 L which is the Uncompressed package and 6.514 M which is the Compressed package. The printer driver diskettes from the original installation package would be used to avoid the problem. a. The Uncompressed package has three (3) printer driver diskettes and the compressed package has two (2). b. The Uncompressed diskettes package contains 25 3.5-inch diskettes with blue labels 31 5.25-inch diskettes with blue labels. c. The Compressed diskette package contains 20 3.5-inch diskettes with salmon labels 25 5.25-inch diskettes with salmon labels

NOTE: The update in packaging also affects the CD-ROM package.

2. If the original installation diskettes are not available, determine what OS/2 2.1 package was used, and follow the instructions below to unpack printer drivers manually or on how to obtain a package to resolve the problem.

**Title:** 930819 ERROR STATING PORT IS NOT INSTALLED  
MIGHT OCCUR WHEN ATTEMPTING TO CREATE A PRINTER  
OBJECT IN OS/2 2.X

DESCRIPTION OF SYMPTOMS:

1. Unable to install printer object. 2. Will receive error that port is not installed. 3. Attempt to remakeINI files did not solve problem.

SUMMARY OF Resolution:

1. A typing error has been made during the attempted MAKEINI procedure. The error has probably been made by typing MAKEINI OS2SYS.INI INI.RC instead of the correct MAKEINI OS2SYS.INI INISYS.RC 2. Simply run the MAKEINI procedure properly to correct problem.

**Title:** 930722 ERROR 004, PRINTER OFF-LINE OR OUT OF  
PAPER ERROR, OR PMV8005 THROUGH 8008 WHEN TRYING  
TO PRINT UNDER OS/2 2.X

#### DESCRIPTION OF SYMPTOMS:

When trying to print on a system running OS/2 2.x the system returns any of the following error messages. 1. The printer is off-line, turned off, or out of paper. 2. Usually associated with ERROR 004, PMV8005, PMV8006, PMV8007, or PMV8008. 3. The printer is On, and On-line, and has paper in it.

#### SUMMARY OF Resolution:

This problem is caused by hardware not being setup correctly or a physical hardware problem with the system. DOS will normally print correctly with just about any hardware configuration so a DOS print test will not exhibit the same print malfunction as OS/2 will experience.

### Title: 930721 GENERAL PRINTER PROBLEMS AFTER UPGRADING TO OS/2 2.1

#### DESCRIPTION OF SYMPTOMS:

1. General printer problems after installing OS/2 2.1 over OS/2 2.0. 2. These problems did not exist until OS/2 was upgraded to 2.1.

#### SUMMARY OF Resolution:

This is generally a problem in the INI files. There is no discovery of the real cause but seems to be related to the installation over the old system. New INI files resolve the problems.

#### DETAILS OF Resolution:

1. If the machine is running, execute a proper Shutdown. 2. Reboot the machine from the Installation disk. a. Insert the Installation disk in drive A and turn on the machine, if the machine is running press Ctrl+Alt+Del to restart. b. When Prompted insert Disk #1. c. At the Welcome to OS/2 Screen press Esc to cancel. 3. Run Check Disk on the OS/2 drive.

NOTE: This document assumes that OS/2 was installed on the C: drive. If OS/2 was installed on a different drive, substitute C: with the appropriate drive letter.

a. If the drive is formatted for the FAT file system, type: CHDKSK C: /F (then press enter) b. If the drive is formatted for the HPFS file system, type: CHDKSK C: /F:3 (then press enter) c. Repeat the appropriate step above (i.e step a or b if the system reports errors).

4. Change to the OS2 directory. a. At the A: prompt type C: (then press enter) b. Type CD OS2 (then press enter) 5. Make backups of the INI files. a. Type RENAME OS2.INI OS2INI.BAK (then press enter) b. Type RENAME OS2SYS.INI SYSINI.BAK (then press enter) 6. Remake the INI files. a. Type MAKEINI OS2.INI INI.RC (then press enter) b. Type MAKEINI OS2SYS.INI INISYS.RC (then press enter) 7. Remove any Disk from Drive A and press Ctrl+Alt+Del to reboot the system.

NOTE: All desktop customization will be lost and must be recreated if returning to the original desktop; however, if a backup copy of the DESKTOP directory was made, it can be used to recover.

The system boot time may increase after executing this procedure because the INI files and Desktop directory must be reconfigured on boot up.

**Title:** 930716 CAN PRINT FROM DOS APPLICATION, BUT CANNOT PRINT ELSEWHERE UNTIL THE DOS APPLICATION ENDS RUNNING UNDER OS/2 2.0

DESCRIPTION OF SYMPTOMS:

Can print from a DOS application in OS/2 2.x, but not able to print anywhere else until the DOS application ends.

SUMMARY OF RESOLUTION; 1. OS/2 2.0 prevents two or more application from simultaneously accessing the same parallel-port hardware. If the DOS application you are initially printing from accesses the hardware directly, subsequent applications must wait for the first one to end, even if the other application is the OS/2 print object. 2. OS/2 2.0 with the Service Pak(XR06055) and any release above provides a share access box in the printer object which allows DOS applications to share a parallel port.

DETAIL OF Resolution:

1. Two processes cannot have access to the same parallel port at the same time under OS/2 2.0.
2. To utilize the Share access option for Service Pak(XR06055) and above machines follow the below steps:
  - a. Open the settings on the print object.
  - b. Select OUTPUT page.
  - c. Open the settings on the port object (i.e. LPT1-LPT3) in the OUTPUT port field that you want DOS applications to share.
  - d. Select SHARE ACCESS check box to share the access of the port
  - e. Close the port object.

NOTE: The above steps may be required for those DOS applications that try to access a port during initialization.

## **General OS/2 Print Problems**

- CONTENT: PRINT PROBLEMS AND SOLUTIONS
- SOURCE: IBM HelpFax, IBM BBS
- DOCUMENT: PRINT.FAX, OS2HELP.ZIP

The following is a compilation of printer problems and solutions from IBM HelpFax. Recieve PRINT.FAX as a single faxed document. Download OS2HELP.ZIP from the IBM BBS for a complete set of all OS/2 FAX documents.

## GENERAL OS/2 PRINTING TIPS -----

### DON'T TRY INSTALLING OS/2 2.0 PAINTJET DRIVER ON A 1.3 SYSTEM

The OS/2 2.0 PaintJet driver does not work on a 1.3 system. This driver (any any other driver) requiring the mirrors.dll will not work with 1.3. The mirrors.dll is a 32 bit dll.

----- DMA

### PARALLEL PORT ARBITRATION LEVEL

When using OS/2 2.0, the DMA parallel port arbitration level should not be disabled. It should be set to SHARED 7. When using OS/2 1.3 with CSD 5054 or greater applied, the DMA parallel port arbitration level should not be disabled. Any level prior to this, should have the arbitration level disabled on those systems with a DMA parallel port (PS/2 models 56, 57, 80-A21, 80-A31, 90, and 95).

### PARALLEL PORT PRINTING PROBLEMS

If nothing prints on an AT (ISA) bus system, the parallel port may be configured incorrectly. This is especially true if the parallel port worked correctly under DOS. Up to 3 parallel ports can be installed on most systems as long as the port address and hardware interrupt levels are set properly. The proper combinations under OS/2 are address 3BC and IRQ7, 378 and IRQ7, and 278 and IRQ5. If these combinations are not used, printer error messages or very slow printing will occur.

AT bus systems are incapable of sharing hardware interrupt levels. This means each adapter in your system must have a different hardware interrupt level assigned. Special code handles the conflict as described in the paragraph above. Many sound cards (Soundblaster) use the same hardware interrupt level as the first parallel port and the conflict must be resolved if you intend to print. Using IRQ10 with Soundblaster is recommended since it does not conflict with the parallel ports (IRQ7, IRQ5). IRQ2 cannot be used since it drives the slave 8259 Programmable Interrupt Controller.

Problems have been found when using certain parallel port printer cables that do not meet the parallel port specifications. Cables that are longer than six feet in length are suspect. Cables that do not contain all 25 wires will not work under OS/2. The six foot cable length problem is more evident on higher speed processor systems.

Some older parallel port adapters fail to generate hardware interrupts. These adapters usually work correctly under DOS since DOS does not use hardware interrupts to print. OS/2, due to its multitasking capability, must use interrupts to transfer data out the parallel port. If your adapter fails to generate interrupts, it must be replaced in order to print under OS/2. If your buffer light illuminates on your printer or if your printer prints the first character and then an error message is displayed after approximately 45 seconds, you may be experiencing an interrupt problem.

----- WHAT

### PRINTERS ARE SUPPORTED?

See the file called PRDESC.LST on the first print driver diskette with the OS/2 2.0 package. It contains a comprehensive list of all the printer models supported.

----- PRINTER

### DRIVERS NO LONGER SHIPPED WITH OS/2 2.0

OS2TOOLS contains a package called OS2PDRV.R. This package contains OS/2 printer drivers that were shipped with OS/2 1.3, but are no longer shipped with OS/2 2.0. It includes IBM3852, IBM5152, IBM5182, IBM52011, and IBM5216. The package states that in the future it will contain BETA

and CSD versions also. The printer drivers can also be accessed in Compuserve (Library 17).

---

#### REDIRECTING PRINTER PORT

To print to a communications port, you must redirect the output:

1. Display the pop-up menu for the appropriate printer object.
  2. Select the arrow to the right of OPEN; then select SETTINGS.
  3. Select OUTPUT.
  4. Display the pop-up menu for the port you want to set up.
  5. Select the arrow to the right of REDIRECTION.
  6. Select the port you need. For example, you might select COM1 to send your output through a communications port. or
1. Select OS/2 SYSTEM; then select Command Prompts.
  2. Select OS/2 Window or OS/2 Full Screen.

SPOOL /D:LPT1 /O:COM1 PRINT MYFILE.TXT /D:LPT1

Note: You can redirect output to a COM port; however, you cannot redirect output from a COM port to a LPT port. The redirection option is only available when two or more printer objects are defined.

---

----- THE FOLLOWING IS FROM OS2TNT DOCUMENT.....

General Information ----- When installing auxiliary parallel port expansion cards, you need to ensure that LPT1 is configured to interrupt level 7 (IRQ7). Not doing so will cause printing under OS/2 to function erratically. Be aware that when using many other common adapters such as the SoundBlaster card, they may come from the factory configured on IRQ7. Also, many manufacturers recommend you configure their cards on IRQ7. Non-microchannel machines cannot share interrupts and each card must be on a separate IRQ to avoid conflicts. See the reference for your adapter cards to configure the IRQs. Additionally, LPT2 cards should be configured on IRQ5.

---

#### QUESTIONS, COMMON PROBLEMS AND ANSWERS

PROBLEM: Automatic emulation switching does not work

RESOLUTION: None

AES does not currently work under OS/2 2.0. Lexmark is working on this to be released soon.

QUESTION: How does AES for OS/2 interact with 2.0 GA?

ANSWER: The basic function of AES is to provide a convenient method for emulation mode switching on the IBM LaserPrinter products. By correlating LPT ports with emulation modes on the printer, a user can send their job to the correct port and set the mode switch properly, and thus not have to touch the printer to change emulation modes. During AES install, the option is given to the user if they want to install extra LPT ports (as the LPTX.SYS Device Driver). This driver is the same identical driver that is used by the Lexmark External Network Adapter, IBM 4033. It essentially allows for character monitors to be installed on LPT ports > 3. Then the character monitor does what it needs to, and re-directs that data to the physical port where the printer is connected. Or in the case of the IBM 4033, the data is re-directed (by the character monitor) to the Token Ring or Ethernet PS/2 card

PROBLEM: Printing problems with parallel ports - nothing prints.

RESOLUTION: Ensure that LPT1 is configured to use IRQ7 and LPT2 is configured as IRQ5. Check the printer cable to ensure that the cable runs all 25 lines, not all cables wire the necessary lines. If the problem persists and you are convinced it is not an interrupt problem, cable problem or just the wrong driver, the problem may be with your I/O card. Some older I/O cards do not work in OS/2.

TIPS AND TECHNIQUES ----- If you send a print job to a printer that is powered off, you may experience a corrupted job when responding to the RETRY dialog after powering on the printer. You should cancel the job and resubmit it after turning on the printer.

BETA

VERSION OF IBM4072 EXECJET DRIVER FROM LEXMARK

Customers who need an IBM4072 ExecJet driver can now get a beta version from Lexmark by calling Lexmark support at 1-606- 232-3000 or by logging on to the Lexmark Bulletin board at 1-606-232-5653. IBM users can obtain the driver by entering the following command at a VM prompt: EXEC TOOLS SENDTO LEXCJN1  
LEXTOOLS DRIVERS GET OS24072 PACKAGE

PARALLEL

CARDS KNOWN NOT TO WORK: Boca Research:

After Calling Boca Researches technical support line, they admitted that the parallel ports in the following cards will NOT work correctly for os/2. These cards will however be upgraded this summer (exact date unclear). IDE Controller cards I/O AT41 and I/O AT45cards.

SIIG: SIIG multi-purpose serial/parallel/game card. -customer could not print with this card. Only printed when he replaced card.

DIAMOND: - DIAMOND I/O DIO-100 Revision A 1985. Card did not work. Customer got printing to work only when the card was replaced.

SOME OEM

PARALLEL PORT CARDS THAT WORK CORRECTLY UNDER OS/2

These are cards that a) the manufacturer confirms that they work under interrupt driven printing for os/2 2.0. or b) Where the succesfull replacement for a card that did not work under os/2 2.0.

BOCA RESEARCH: IO AT 44 - confirmed by manufacturer and customer  
IO AT 24- confirmed by manufacturer EVEREX: EVEREX Multi I/o card (model???) - confirmed by customer

## **WINOS2 General Printing Information**

- CONTENT: WINOS2 GENERAL PRINTING INFORMATION
- SOURCE: IBM HelpFax, IBM BBS
- DOCUMENT: WINPRINT.FAX, OS2HELP.ZIP

The following is a compilation of printer problems and solutions from IBM HelpFax. Recieve WINPRINT.FAX as a single faxed document. Download OS2HELP.ZIP from the IBM BBS for a complete set of all OS/2 FAX documents.

#### WINOS2 General Printing Information -----

In order to print using WIN-OS2 you need to install the WIN-OS2 3.0 printer driver for your printer. The WIN-OS2 3.0 printer drivers included with OS/2 2.0 are the same drivers that originally shipped with Microsoft Windows 3.0. There are some Window 3.0 drivers that do not have an equivalent OS/2-2.0 printer driver and conversely, there are OS/2-2.0 printer drivers that do not have an equivalent Windows 3.0 driver. Lack of features, lack of a specific printer driver or driver feature in WIN-OS2 is no different than that of DOS/WINDOWS. If you have a WIN-OS2 printer driver without an equivalent OS/2 printer driver, use the IBMNULL OS/2 printer driver for that port. The OS/2-2.0 printer driver will have no effect on printing from WIN-OS2. A list of supported printers for WIN-OS2 and OS/2 is on the OS/2 Driver Disk 1 in the files PRDEV.LST and PRDESC.LST. If you need to print using LPT3 or LPT4 via a redirected network printer, you must add LPT3.OS2 and LPT4.OS2 to the WIN.INI file underneath LPT2.OS2. The WIN.INI file is in the OS2 MDOS WIN-OS2

#### General Problems and Solutions =====

Problem: OS/2 did not install an WIN-OS2 printer driver.

Answer: Try to install the printer driver yourself using WIN-OS2 Control Panel. If no printer driver exists for your printer, look at your printer manual for another printer that your printer can emulate and try to install that printer driver. Even though some printers say they can emulate other printers, this is not always 100% true. Call the printer manufacturer and ask if they have printer drivers available or to ask what printer driver to use.

Problem: There is no equivalent OS/2 driver for my printer.

Answer: There may be a WIN-OS2 printer driver, even though there is not a OS/2 printer driver. Use the OS/2 2.0 IBMNULL printer driver if this is the case.

Problem: I had a printer driver that worked with my computer under DOS/WINDOWS, but I am having printer problems with WIN-OS2.

Answer: You may have received a more updated driver from the printer manufacturer or other sources. As long as the printer driver is Windows 3.0 compatible, it will work the same under WIN-OS2. Find the driver you used with DOS/WINDOWS and install it for WIN-OS2.

Problem: My WIN-OS2 printer driver does not include all features that the IBM OS/2-2.0 printer drivers have. This can include multiple bins, form selection, and other features.

Answer: These are the same printer drivers provided with DOS/WINDOWS. IBM does not plan to offer Windows printers drivers with capabilities different from the DOS/WINDOWS feature set.

Problem: Printing is slow from WIN-OS2.

Answer: This depends on printer, memory available, etc. This is not a defect, but a hardware or software configuration problem. Try disabling the Windows Spooler if it is enabled. WIN-OS2 should actually print faster than DOS/WINDOWS if your system is properly configured.

#### WIN-OS2 ATM Problems and Answers =====

Problem: Windows applications do not show ATM Fonts.

Answer: From a full screen WIN-OS2 Session, go to the WIN-OS2-MAIN folder and select the ATM Icon. Then install the ATM fonts using the last OS/2 Driver Disk. (Driver Disk 5 on 3-1/2" disks).

Problem: Can I use the same ATM fonts for both OS2 and WIN-OS2.

Answer: You can install the same set of ATM fonts for both OS2 and WIN-OS2. However, the ATM Font installation programs work differently and will create two different sets of font files with different

extensions. Therefore, there is no way to save disk space by actually sharing the actual font files.

Problem: The fonts I see on the screen do not exactly match the fonts being printed.

Answer: IBM ATM fonts metrics were specifically provided for OS2 so that they could also be used in international settings. Some of the font metrics for certain fonts ,Zaph-Dingbats among others, do not always match the font metrics provided as printer device fonts on some postscript printers. Either install a set of ATM Fonts that match your printer fonts, or turn off "USE DEVICE FONTS" in the ATM control panel in the WIN-OS2\_MAIN folder.

#### WIN-OS2 Printer Specific Problems and Answers

---

Printer: IBM 4019/4029

Windows shows "Can't find 300.DRV/600.DRV" error message. This error can occur when trying to print, to preview, copying to the clipboard in MS Excel and other places. Solution: Using the WIN-OS2 Control Panel, delete the printer and reinstall it. APAR# PJ03858.

Cannot print correctly using Postscript 39 Font Driver. Use 17 Font Driver. APAR# PJ03796

Printer: Panasonic P4420/50.

Cannot select A4 cassette, device defaults to bin option. No workaround. APAR# PJ03789.

Printer: Postscript Printers.

Apple Laserwriter. Any use of Dashed lines cause all lines to be dashed. DOS/Windows 3.0 driver had same problem. Do dashed line prior to doing solid lines. (Works for Windows Problem).

IBM 4019/4029. Cannot print correctly using Postscript 39 Font driver. Use 17 Font driver.

Printer: Epson Printers

Printer driver doesn't give option for intelligent forms feeds or disabling form feeds. Try a different driver. APAR PJ03858.

## **Common Problems with Printing in DOS Applications**

- CONTENT: COMMON PROBLEMS WITH PRINTING IN DOS APPLICATIONS
- SOURCE: IBM HelpFax, IBM BBS
- DOCUMENT: DOSPRT.FAX, OS2HELP.ZIP

The following is a compilation of printer problems and solutions from IBM HelpFax. Recieve DOSPRT.FAX as a single faxed document. Download OS2HELP.ZIP from the IBM BBS for a complete set of all OS/2 FAX documents.

## COMMON PROBLEMS WITH PRINTING IN DOS APPLICATIONS

---

\*PROBLEM\* DOS application generated print job spools but does not print.  
(Green arrow still points to document in job object found in the print object).

\*SOLUTION\* The DOS application has not closed the printer data stream. If the DOS application is printing using BIOS interrupt 17h then use the PRINT\_TIMEOUT DOS Setting to force the data stream closed. You may be able to determine if the application is using int 17h (as opposed to int 21h) by the destination name. LPTx in Win-OS/2 uses int 17h while LPTx.OS2 uses int 21h function calls. Parallelx in DOS uses int 17h. LPTx in DOS can be either one, older versions of applications use int 17h. The PRINT\_TIMEOUT setting, by default, is turned ON and set to 15 seconds. User should wait 15 seconds, if the job doesn't complete spooling, then the DOS application is not using int 17h (See discussion below on lptdd.sys).

---

\*PROBLEM\* DOS application generated print job is split into several spool files.

\*SOLUTION\* If the DOS application opens and closes the printer data stream for every character, line, or page then there is nothing short of disabling the spooler for that printer to correct this problem. An alternative may be to upgrade the application. Contact the manufacturer. If the problem occurs with complex printouts, then you may need to increase the DOS Settings PRINT\_TIMEOUT value.

---

\*PROBLEM\* The DOS application generated print job will not begin printing until the application is terminated.

\*SOLUTION\* The DOS application has opened the data stream and sent the print output but has not closed the data stream. If the application is printing using int 21h, then use the DOS\_DEVICE DOS Setting to load the c: os2 mdos lptdd.sys device driver to convert the int 21h calls into int 17h calls. The PRINT\_TIMEOUT DOS Setting can be used to close the print job.

---

\*PROBLEM\* My security device attached to the parallel port doesn't work. Any of my DOS applications that use the security device can only be started from one DOS session. An error message is displayed when trying to start additional copies of this application.

\*SOLUTION\* USER can press the key sequence Ctrl-Alt-PrtSc simultaneously to have the security software release access to the parallel port software prior to starting second copy of the DOS application.

---

\*PROBLEM\* After printing from one DOS application and then trying to print from anywhere else within OS/2, nothing prints. When I terminate the DOS application, other printing works fine.

\*SOLUTION\* The particular DOS application you are initially printing from, is accessing the parallel port hardware directly. OS/2 prevents

collisions from two or more applications trying to access the same parallel port hardware simultaneously by preventing the second access until the first DOS application terminates. This is true even if the second application is the OS/2 print object!

---

\*PROBLEM\* Other parallel attached devices (not printers) such as tablet systems, LAN adapters, and parallel to SCSI devices do not work in a DOS session.

\*SOLUTION\* There's a current restriction within DOS sessions where hardware interrupt IRQ7 is not reflected into the DOS session. OS/2 development is aware of this limitation and is working on a solution. These hardware attachments may attempt to use this feature of the parallel port and are prevented from doing so.

---

\*PROBLEM\* I have a PS/2 system that supports a DMA parallel port. Can OS/ take advantage of this?

\*SOLUTION\* The current systems with a DMA parallel port include PS/2 models 56, 57, 80-A21, 80-A31, 90 and 95. Customer with these systems should ensure that the built-in parallel port arbitration level is set to SHARED7 (DMA is enabled). OS/2 will automatically take advantage of this feature; no additional setup is required. OS/2 1.3 customers with CSD 5054 or greater can reenable this feature. Use the reference diskette shipped with this system to view the system configuration (setup).

---

\*PROBLEM\* My printer does not have a supported OS/2 PM printer driver.

\*SOLUTION\* If your printer driver is not among the 200 printers supported then determine if your printer supports a more common printer emulation mode. Install the printer driver that supports your printer in the emulation mode.

---

\*PROBLEM\* My printer has a supported Win-OS/2 printer driver but not a PM printer driver. How should I configure my system?

\*SOLUTION\* If you will be doing primarily Win-OS/2 printing then setup the proper Windows printer driver within the control panel. Setup the OS/2 print object with the IBMNULL printer driver. You should be able to print from Win-OS/2 with no problems. Contact your printer manufacturer to obtain an OS/2 printer driver or to determine what other printers your printer emulates.

---

\*PROBLEM\* Printing from Win-OS/2 is very slow, everywhere else is okay.

\*SOLUTION\* If printing from Win-OS/2 and Print Manager is specified for the printer, then you may need to set the Print Manager Options menu to a higher priority than what it is currently set to.

---

\*PROBLEM\* My system has an AT bus (ISA) and my parallel printer prints slowly from anywhere under OS/2, DOS, or Win-OS/2 sessions.

**\*SOLUTION\*** Your parallel port address and hardware interrupt levels are not set correctly. Valid parallel port combinations include 3BC/IRQ7, 378/IRQ7, and 278/IRQ5. Power off your system, remove the parallel port adapter and configure the adapter by adjusting the DIP switches and/or jumpers to set the parallel port to one of these industry standard combinations. Make sure that other adapter cards are not interrupting on the same interrupt levels. Sound, MIDI and serial cards can share these same hardware interrupt levels.

---

**\*PROBLEM\*** Printing works just fine under the DOS operating system but after installing OS/2, printing does not work.

**\*SOLUTION\*** If the print output can be seen in the print object (if spooler is enabled), then the problem is most likely either the cable or the hardware interrupt level. See the solution above for directions to configure your parallel port. Some signals used to transmit data under OS/2 are not used when printing under DOS, some cable manufacturers reduced the costs of their cables by not wiring these signals. You may need to purchase a new cable. Some older parallel port adapter cards do not interrupt properly, since DOS did not use this feature you may not have seen this problem. You may need to upgrade your parallel port adapter.

---

**\*Problem\***

Customer has Printer Speedup boards and or utilities that can be used under DOS but not OS/2 such as printer engines and Postscript speedup devices.

**\*Solution or Limitation\***

These Speedup boards are not supported under 2.0. The only possibility of using them is if they are not for a specific printer port that is also a generic printer port under OS/2 for example LPT3 and a physical LPT3 device exists, the customer may be able to either use the device driver in a VDM or in a VM Boot session. This is the only possible support.



# **OS/2 2.1 Advanced Support Workshop**

## **AUDIENCE**

- Individuals who currently provide end user support and want to extend their skills to offer better support

## **PREREQUISITES**

- The course "Installing and Supporting OS/2 2.1 (P1071) or equivalent knowledge is required

## **OBJECTIVES**

- Upon completion of this course, students should be able to provide more end user support and apply a systematic approach to problem determination and resolution



# P1072 Agenda

---

- Day 1

- Resolving various bugs
- OS/2 Video Support
- MMPPM/2 Environment
- What Support is there?

- Day 2

- Introduction to REXX
- Introduction to Advance REXX
- Printing
- OS/2 Maintenance and Recovery
- Introduction to INF files



# **OS/2 2.1 Advanced Support Workshop**

By the end of this course you will be able to:

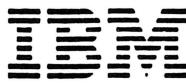
- Discuss the effects of altering various OS/2 parameters
- Explain how OS/2 handles the Video subsystem
- Describe the OS/2 support of its' multimedia features
- State the available OS/2 Support services
- Create and run simple REXX programs
- Create and run programs that can automatically create folders and program reference objects on their Desktop.
- Describe how OS/2 internally handles printing requests
- Create a bootable OS/2 diskette
- Create an "INF" file



IFS=D:\OS2\HPFS.IFS /CACHE:64 /CRECL:4 — installable file system.  
PROTSHELL=D:\OS2\PMSHELL.EXE  
SET USER\_INI=D:\OS2\OS2.INI { - Setup and desktop info.  
SET SYSTEM\_INI=D:\OS2\OS2SYS.INI } - abstract object types.  
SET OS2\_SHELL=D:\OS2\CMD.EXE  
SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS,CONNECTIONS  
SET RUNWORKPLACE=D:\OS2\PMSHELL.EXE  
SET COMSPEC=D:\OS2\CMD.EXE  
LIBPATH=.;D:\OS2\DLL;D:\OS2\MDOS;D:\;D:\OS2\APPS\DLL;d&c  
olon.\LABS;E:\TOOLKT21\DLL;  
SET PATH=d:\LABS;D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS2  
;D:\OS2\INSTALL;D:\;D:\OS2\MDOS;D:\OS2\APPS;E:\TOO  
LKT21\OS2BIN;  
SET DPATH=d:\LABS;D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS  
2;D:\OS2\INSTALL;D:\;D:\OS2\BITMAP;D:\OS2\MDOS;D:\  
OS2\APPS;E:\TOOLKT21\OS2BIN;  
SET PROMPT=\$i>\$p'  
SET HELP=d:\LABS;D:\OS2\HELP;D:\OS2\HELP\TUTORIAL;e:\TOO  
LKT21\OS2HELP;  
SET GLOSSARY=D:\OS2\HELP\GLOSS;  
SET IPF\_KEYS=SBCS  
PRIORITY\_DISK\_IO=YES  
FILES=20  
DEVICE=D:\OS2\TESTCFG.SYS — allows after the first selective install.  
DEVICE=D:\OS2\ DOS.SYS  
DEVICE=D:\OS2\PMDD.SYS  
BUFFERS=30  
IOPL=YES — direct access to character devices - mouse, keyboard, screen, printer.  
DISKCACHE=1024,LW,AC:D  
MAXWAIT=3  
MEMMAN=SWAP,PROTECT  
SWAPPATH=D:\OS2\SYSTEM 2048 2048  
BREAK=OFF  
THREADS=256  
PRINTMONBUFSIZE=134,134,134  
COUNTRY=001,D:\OS2\SYSTEM\COUNTRY.SYS  
SET KEYS=ON  
REM SET DELEDIR=C:\DELETE,512;D:\DELETE,512;E:\DELETE,512;F&col  
on.\DELETE,512;G:\DELETE,512;  
BASEDEV=PRINT02.SYS  
BASEDEV=IBM2FLPY.ADD  
BASEDEV=IBM2SCSI.ADD /LED  
BASEDEV=OS2DASD.DMD  
SET BOOKSHELF=D:\OS2\BOOK;d:\LABS;e:\TOOLKT21\BOOK;  
SET EPMPATH=D:\OS2\APPS;  
REM DEVICE=D:\OS2\APPS\SASYNCDB.SYS  
PROTECTONLY=NO  
SHELL=D:\OS2\MDOS\COMMAND.COM D:\OS2\MDOS  
FCBS=16,8  
RMSIZE=640  
DEVICE=D:\OS2\MDOS\VEMM.SYS  
DOS=LOW,NOUMB  
DEVICE=D:\OS2\MDOS\VDPX.SYS  
DEVICE=D:\OS2\MDOS\VXMS.SYS /UMB  
DEVICE=D:\OS2\MDOS\VDPMI.SYS

SET RESTARTOBJECTS =  
NO  
STARTUP FOLDERS ONLY  
REBOOT ONLY





```
IFS=D:\OS2\HPFS.IFS /CACHE:64 /CRECL:4
PROTSHELL=D:\OS2\PMSSHLL.EXE
SET USER_INI=D:\OS2\OS2.INI
SET SYSTEM_INI=D:\OS2\OS2SYS.INI
SET OS2_SHELL=D:\OS2\CMD.EXE
SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS,CONNECTIONS
SET RUNWORKPLACE=D:\OS2\PMSSHLL.EXE
SET COMSPEC=D:\OS2\CMD.EXE
LIBPATH=. ;D:\OS2\DLL;D:\OS2\MDOS;D:\;D:\OS2\APPS\DLL;d&c
@on.\LABS;E:\TOOLKT21\DLL;
SET PATH=d:\LABS;D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS2
;D:\OS2\INSTALL;D:\;D:\OS2\MDOS;D:\OS2\APPS;E:\TOO
LKT21\OS2BIN;
SET DPATH=d:\LABS;D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS
2;D:\OS2\INSTALL;D:\;D:\OS2\BITMAP;D:\OS2\MDOS;D:\
OS2\APPS;E:\TOOLKT21\OS2BIN;
SET PROMPT=$i>$p'
SET HELP=d:\LABS;D:\OS2\HELP;D:\OS2\HELP\TUTORIAL;e:\TOO
LKT21\OS2HELP;
SET GLOSSARY=D:\OS2\HELP\GLOSS;
SET IPF_KEYS=SBCS
PRIORITY_DISK_IO=YES
FILES=20
DEVICE=D:\OS2\TESTCFG.SYS
DEVICE=D:\OS2\ DOS.SYS
DEVICE=D:\OS2\PMDD.SYS
BUFFERS=30
IOPL=YES
DISKCACHE=1024,LW,AC:D
MAXWAIT=3
MEMMAN=SWAP,PROTECT
SWAPPATH=D:\OS2\SYSTEM 2048 2048
BREAK=OFF
THREADS=256
PRINTMONBUFSIZE=134,134,134
COUNTRY=001,D:\OS2\SYSTEM\ COUNTRY.SYS
SET KEYS=ON
REM SET DELDIR=C:\DELETE,512;D:\DELETE,512;E:\DELETE,512;F&col
on.\DELETE,512;G:\DELETE,512;
BASEDEV=PRINT02.SYS
BASEDEV=IBM2FLPY.ADD
BASEDEV=IBM2SCSI.ADD /LED
BASEDEV=OS2DASD.DMD
SET BOOKSHELF=D:\OS2\BOOK;d:\LABS;e:\TOOLKT21\BOOK;
SET EPMPATH=D:\OS2\APPS;
REM DEVICE=D:\OS2\APPS\SASYNCDB.SYS
PROTECTONLY=NO
SHELL=D:\OS2\MDOS\COMMAND.COM D:\OS2\MDOS
FCBS=16,8
RMSIZE=640
DEVICE=D:\OS2\MDOS\VEMM.SYS
DOS=LOW,NOUMB
DEVICE=D:\OS2\MDOS\VDPX.SYS
DEVICE=D:\OS2\MDOS\VXMS.SYS /UMB
DEVICE=D:\OS2\MDOS\VDPMI.SYS
```





```
DEVICE=D:\OS2\MDOS\VCDROM.SYS
DEVICE=D:\OS2\MDOS\VWIN.SYS
REM DEVICE=D:\OS2\PCMCIA.SYS
REM DEVICE=D:\OS2\MDOS\VPCMCI.A.SYS
DEVICE=D:\OS2\OS2CDROM.DMD /Q
IFS=D:\OS2\CDFS.IFS /Q
BASEDEV=OS2SCSI.DMD
DEVICE=D:\OS2\MDOS\VMOUSE.SYS
DEVICE=D:\OS2\POINTDD.SYS
DEVICE=D:\OS2\MOUSE.SYS
DEVICE=D:\OS2\COM.SYS
DEVICE=D:\OS2\MDOS\VCOM.SYS
CODEPAGE=437,850
DEVINFO=KBD,US,D:\OS2\KEYBOARD.DCP
DEVINFO=SCR,VGA,D:\OS2\VIOTBL.DCP
SET VIDEO_DEVICES=VIO_VGA
SET VIO_VGA=DEVICE(8VHVGA)
DEVICE=D:\OS2\MDOS\VVGA.SYS
SET IPFC=e:\TOOLKT21\IPFC;
SET INCLUDE=e:\TOOLKT21\C\OS2H;e:\TOOLKT21\C\OS2H\VDD;e:\TOOLKT21\ASM\OS2INC;
SET LIB=e:\TOOLKT21\OS2LIB;
```



---

## **OS/2 Questions**

1. What is the purpose of the ***LIBPATH*** statement?

2. What is ***SET KEYS = ON***?

3. What is meant by ***REM***?

4. What is ***SWAPPATH=D:\ 4052 2048***?



5. What is **DEVICE=D:\OS2\M DOS\VE MM.SYS?**

6. What is **IFS=D:\OS2\HPFS.IFS**

7. What is the purpose of **RUN?**

8. What is **OS2.INI?**

9. What is a **DEVICE=**?



10. Where are the Config.sys files located?

11. Where is the OS2.INI file located?

12. What drive letter is assigned to Boot Manager?









